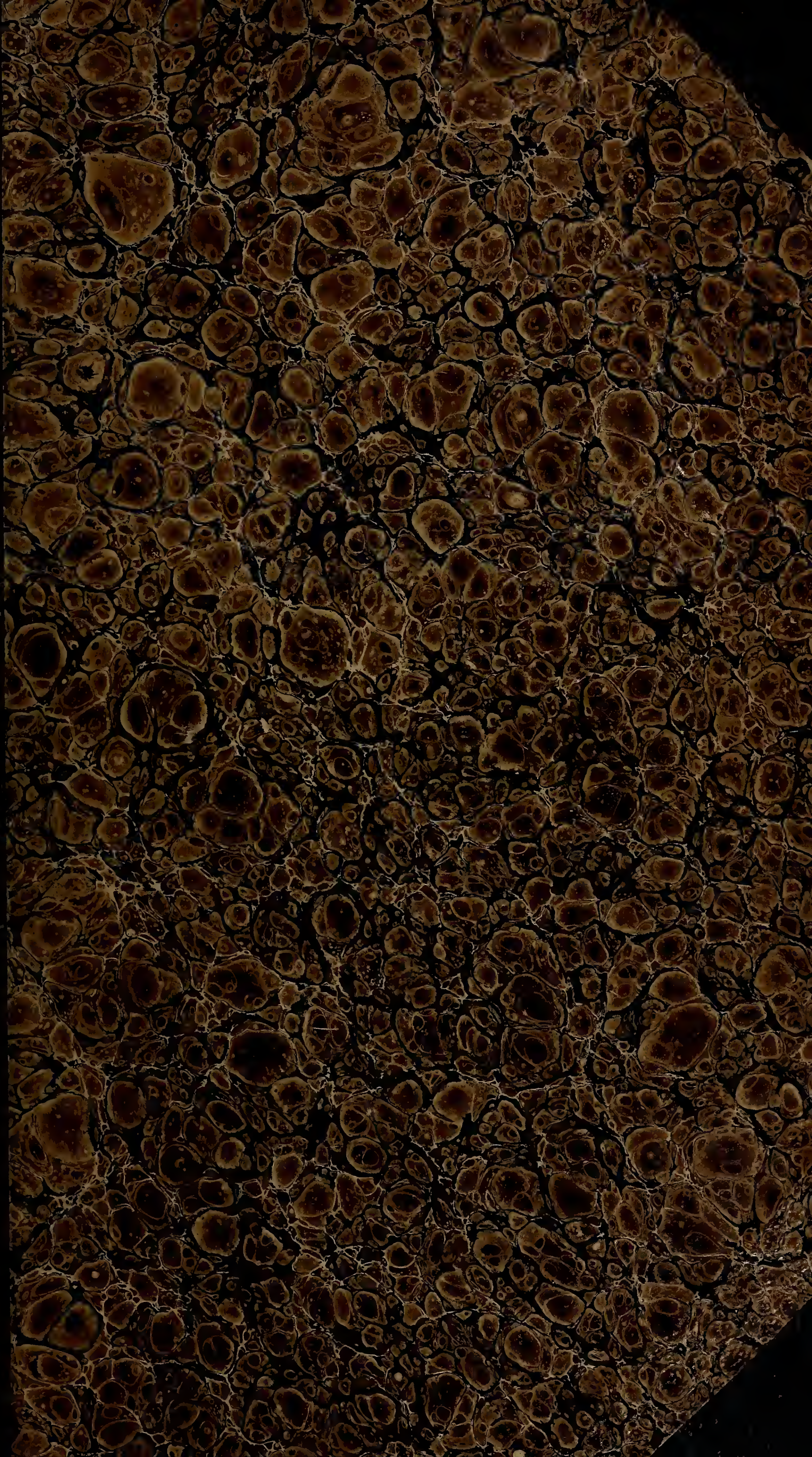

BOSTON MEDICAL
JUL 31 1891
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THE
DENTAL TIMES.

VOL. X. PHILADELPHIA, JULY, 1872. No. 1.

Original Communications.

DENTO-NEURALGIA.

BY J. S. SMITH, D. D S., COLUMBIA, PA.

Neuralgia, (νευρον, and λογος, pain,) nervous pain or pang, generic name for a number of diseases, the chief of which is a very acute pain, exacerbating or intermitting, which follows the course of a nervous branch, extends to its ramification, and seems therefore to be seated in the nerve. In facial neuralgia the pain is traced to the facial nerves, or *vice versa*, the pain having its origin in these nerves. We term it facial neuralgia, termed by a well-known author, "the principal neuralgiæ" of which the infraorbitar, maxillary and frontal are but divisions.

A division of anomalous neuralgiæ has likewise been admitted. Under this name Chaussier has included different neuroses, some of which are characterized by acute pains, circumscribed within a short compass, or extending by irradiations, but not having their seat in the course of a nerve; and others which are occasioned by tumors in the course of a nerve, or which succeed contusions or incomplete divisions of nerves.

Then we have what is termed "false neuralgia," the exciting cause produced by some body compressing it The terms given to neuralgia are derived from the locality in which the organ is found to be diseased. While the terms may differ widely, the pathology of neuralgia is the same.

Although the term "dento-neuralgia" has not been given in any of the standard works, it nevertheless should be, and I believe it has been the cause of many erroneous blunders in diagnosing neuralgia in the region of the face, head, neck, and at remote parts of the body. The term given by Prof. Dunglison—"Odontalgia Nervosa, 'Neuralgia Dentalis,' neuralgia of the teeth, characterized by periodical pain, shooting with the utmost violence along the branches of the fifth pair, distributed to the affected jaw,"—is good as far as it goes, but is a poor guide upon which to rest a diagnosis when the value of the teeth are taken into consideration. The term is too general in its construction. There may be a neuralgic affection of the fifth pair, while the teeth may be free from caries, and the nerves of each tooth perfectly healthy; and by removing the entire dentine we may utterly fail to remove the pain and perform a cure; and when the fifth pair is affected from causes arising from the nerves of the teeth, it is not so much from inflammation of the pulp as it is from its death and suppurative condition. The gases generated therefrom give rise to irritation by passing through the foramina at the apex, and if a membrane or sack be formed from the action of the generated gas, this becomes the exciting cause, and will soon have pressure from the abnormal condition of the parts to add to the trouble.

We have now dento-neuralgia in all its beauty and sympathy—for in dento-neuralgia we have the sympathetic effects in the connection of the fifth pair, already alluded to, as well as the sixth, seventh, eighth, ninth, tenth, and the cervico-spinal nerves. These sympathetic affections are frequently localized where the pain is felt, and the nomenclature used to recognize them have no claim or title. We attribute this to the lack of information upon dental pathology and better acquirement of dental anatomy, &c. It is therefore apparent to the close observer, that to be able to make a correct diagnosis in this frequently most obscure disease, the dental system should be studied well, in connection with the great nervous system, all of which must be based upon the science of anatomy, physiology and pathology. The more obscure the cause of disease, the greater will be the demand for acquired skill on the part of the operator to fathom and unveil the mystery. The astronomer might look out upon the starry dome with naked eye, but to unveil the mysteries beyond his power of vision would be futile; but let him bring what science has placed within his reach to bear upon it, the mysteries of the heavens are unveiled, and he is satisfied for present success. It is so in the kindred scientific pursuits. To be able to see the phenomena constantly passing before the eyes of the dentist, enveloped in the wonderful nervous system, the science of anatomical, physiological and pathological requirements must be brought into requisition. As the telescope is to the astronomer, so this science is to the dentist—enabling him to see clearly dento-cause and sympathetic effect, making the dento-neuralgic phenomena.

The organs of the body cannot be comprehended as a whole, unless each organ and system be well understood as to their individual intention. They have direct sympathy with each other; they are mutually dependent upon each other, having their wide-spread influence in the body. By touching one you indirectly touch all. Break the connection between the dental nerve at the apex of a tooth, and the tooth will become insensible, dead. If the optic be ligated or cut, the sight is lost, &c.

The following interesting case came under my notice for treatment: Mr. F—, aged 21 years, nervo-lymphatic temperament, under medical treatment one month for pains affecting the first great branch of the fifth pair and seventh pair, affecting the ophthalmic branch (right) supraorbital nerves. These pains were distressing; patient for want of proper rest was falling away in flesh, (naturally fleshy;) had given up his occupation, (carpenter.) Upon examination his teeth were found in good condition, with a few exceptions, (dense yellow group,) patient stating that the right lower first molar had been filled with a soft filling about four months ago, but it had worked out. Tooth did not pain in the least; but upon percussion a slight pain was felt. Upon further examination I found a very thin layer of bone over the pulp, highly sensitive to the touch of the instrument. The pulp I removed found to be in a semi-dentalized condition; applied the usual treatment to nerve cases, after extirpating, for a few days; pain subsided at the close of my treatment. In the meantime the patient ceased taking medicine previously prescribed by physician. The tooth was filled with a good metal filling, and the pain has not returned, the operation having been performed in April last.

Many cases could be cited which were for years subjected to treatment without relief, and for weeks have been prostrated upon a bed of pain, having exhausted the Materia Medica for remedies, in connection with phlebotomy, cupping and leeching, sea bathing, Russian and Turkish baths, cold and warm, sulphur and vapor baths, division and excision of the nerve, the electric current, homœopathy, hydropathy, quack medicines, and other remedies. I venture to state that seventy-five per cent. of all this neuralgia trouble originated with the teeth and diseased condition of the associated parts. Dento-neuralgia is no mean curiosity of pathological phenomena to the mind of the dentist who aims to save the natural organs and his patient from unnecessary suffering. Being so closely allied to the field in which the dentist is engaged, those of greater pretensions, of far-reaching learning, might think the study of dento-anatomy, physiology and pathology beneath them; hence they neglect this important study, the branch system of anatomy, physiology and pathology of the dental organization, as being unnecessary. What we need to-day is more light thrown upon this subject in the medical and dental professions. The dental profession should have text-books on this subject, written for students, and those of the medical profession who have room to learn even from a text-book on dento-pathology.

AN EXPERIMENT AND ITS RESULT.

Read before the Susquehanna Dental Association, May 16th, 1872.

BY H. GERHART, D. D. S.

Six months ago, (Nov. 1871,) at the close of a busy day, a lad of 14 presented himself, who, twenty-four hours previous, had received upon the mouth a blow from a shinney, whereby the left lateral and central incisors of the upper jaw were dislocated, the right lateral broken off near the gum, and the right central entirely dislodged, while the lips and the gums of the upper jaw were bruised and lacerated; the parts were highly inflamed, and had an unpromising appearance.

After considering the case a few moments, remembering the recuperative power of youth, and with an eye to preventing the contraction of the arch that would follow the loss of two teeth, and the unsightliness of a solitary central incisor, I concluded to try an experiment to replant the dislodged tooth and to pivot the broken one. The dislocated teeth he had with his own hand pressed back to their sockets.

Upon asking him for the missing central, he said one of his mates had carried it to the school-room, half a mile away. When he understood what was proposed to be done, he was off like a shot, and in a short time I had in my hand a tooth that for more than twenty-four hours had been drying in a heated school-room. This tooth appeared more unpromising than the mouth, but the lad was anxious for the experiment from the moment it was suggested.

The apex of the root was shortened and polished, the root filled with gold, and the tooth soaked five minutes in warm water slightly impregnated with carbolic acid; the socket was carefully cleared of the coagulum and incipient granulation, and thoroughly syringed with warm water, when the tooth was slowly but firmly pressed home, and secured by a ligature to its mate; after this the parts were for ten days, several times each day, bathed with highly diluted tincture of calendulum, no other dressing being used.

The lips and gums continued inflamed and swollen for a number of days, with considerable suppuration, which was to be expected. There was not much pain, but for more than two days the patient complained that the replanted tooth felt cold, and not until near the end of the third day was it "warm and comfortable," as he expressed it.

In the process of suppuration the tooth was extruded slightly from its socket, from which two results followed—the tooth is a little more flexible and is a trifle longer than its mate, but not sufficiently so as to make it either inconvenient or unsightly.

After the lapse of two months the pulp of the broken tooth was devitalized (it had retained its vitality all this time) and the root was pivoted;

and two months later a crown cavity in the replanted tooth was filled, and to this day the lad has felt no discomfort from the tooth, and to an ordinary observer there is no difference between its color and the color of its neighbors.

I have written this that we may be impressed afresh with the importance of the conservation of the natural organs, and that we may renew our trust in our most faithful ally—Indulgent Nature.

CELLULOID BASE.

BY DR. JAMES LEWIS, OF MOHAWK, N. Y.

I have had some varied experiments with Celluloid Base, good, bad and indifferent.

Some of my work, a year old, does well. A clergyman with only the two superior centrals (incisors) and the wisdom teeth, desired an artificial denture to replace one that had been worn some time, and was becoming comparatively useless on account of the protrusion of the centrals, partly due to absorption of the alveolus where the side teeth had been removed. This case was one to test the merits of the new base, and I took much interest in it. My patient called on me a few hours ago for the first time since the teeth were inserted. I found the plate had shrunk a very little, so that the tops of the gums each side of his two natural centrals *pinched* on removing or inserting the plate. A little grinding relieved the difficulty. My patient expressed satisfaction with the plate. The mouth had changed during the year, so that the false teeth were perceptibly "shorter" than when they were inserted. In the year a number of plates have been inserted of which I have no knowledge since. A few have come back badly warped. These were made, perhaps, six months ago. Some of my best results, I think, may be said to have been obtained with flasks *thoroughly dried* before going into the oil bath, and pressed at a temperature of 295 to 300°. The warped plates were no doubt originally defective, having too much camphor in them. But these were "cooked" with the plaster not previously dried, heating to 300 to 305° F. Probably if these warped plates had been heated in dried flasks, and heated very slowly up to 295°, and kept at that temperature ten or fifteen minutes after pressure, the surplus camphor might measureably have been volatilized.

One of my latest bad results was a *cracked plate.* The base was probably made with just as little camphor as would work. My flask had been dried over night on a hot stove; was hot when I put it in oil; perhaps as high as 212°. The plate was pressed at 290 to 295°, and went down remarkably easy. When pressed, it was immediately put in ice water and covered with snow. Was at 32° when I opened the flask. Plate cracked at posterior angle or termination of alveolar ridge on each side; on one side two divergent cracks, on the other side only one. Cracks also appeared against junction of molar section with bicuspid section, and against junction of bicuspid section with cuspid on one side only. Finished up the plate, wet the cracks with ether, and pressed into them a solution of scraps of base in ether. Patient wore away the plate; returned with cracks opened. Repaired the cracks as before, and bridged them over with thin films of collodion, (*base* dissolved in ether,) since which time, say three or four weeks, have heard nothing from the patient.

In this case the plate was *heated* too much, no doubt, and *cooled* too much. The actual temperature at which plates may be pressed, is probably not near 280° F.

Another case offers exceptional interest. It was an experiment. A gentleman wanted one front tooth, lower; plate to clasp around bicuspids, each side. Got the case in the flask, then took scraps of base, scoured them with soap and pumice-stone on brush wheel; cut the scraps in bits half an inch square or less. Took a *very thick solution* of "base" in ether, plastered it on the model, then built in my fragments, using more softened base as a cement to fill up crevices, and after feeling assured I had got on enough pieces to make a *full flask*, I set the flask away to dry over night. Next morning found my work apparently in condition to go into the oil bath. Applied heat as in any other case. The plaster had not been dried, so it took some time to boil out the surplus water. While the flask was heating, my rooms were pervaded with a pungent odor of camphor and ether, such as I had not before experienced. But the plate came out all right. It was a curious looking plate, there being in its composition fragments of several different samples of "base," together with conspicuous traces of the *cement* with which they were united.

My experience indicates that shrunken plates may be expected when too much camphor has been incorporated in the base, and not enough *prolonged* heating applied. A temperature too high is detrimental, causing bubbles in plates. Too much cooling is detrimental in those cases in which the camphor is least.

Repairs can be easily made by *cementing in fragments* where needed, and subsequently pressing them under heat, as a new case. Slight repairs can be made by using a very fluid ethereal solution of base to prepare the surface, then building up thin films of a thicker solution, letting each additional film dry before another is applied.

As to the *permanence* of the Celluloid Base, I fear we cannot hope much. It is certain that the camphor does dissolve out, and when that occurs, the "celluloid" contracts just as it would if dried from a solution.

EXTENSIVE CARIES OF SUPERIOR MAXILLARY BONE, THE RESULT OF ALVEOLAR ABSCESS.

BY ELIHU R. PETTIT, D. D. S.

On the 3d of February, 1870, Mr. S. B. presented himself at the clinic of the Pennsylvania College of Dental Surgery, with a discharge of pus from the upper jaw. Upon examination, I found a very small opening in the position of the left superior canine tooth, from which pus was forced by pressing upon the gum over the alveolus. This discharge had been first noticed about fifteen months previously, it then being nothing more than an abscess upon the canine tooth; but as it did not cease, he had the tooth extracted about four months before he visited our clinic. Its extraction was followed by a copious discharge of pus. Since then nothing had been done for the disease, except to syringe the cavity with a solution of Castile soap. Examining the cavity with a probe, I found that a large portion of both of the superior maxillary bones had been destroyed; so much, indeed, as to include much of that between the mouth and nasal cavities, and extending behind the incisor teeth, (all of which were in position,) to, or a little beyond, the right canine. Pressure upon the palate proved the absence of bone over a considerable portion of it, as the mucous membrane was soft and yielding, and the pressure forced the pus out of the opening at the alveolar ridge. I enlarged this opening considerably, and syringed the cavity thoroughly first with warm water, and then with a strong solution of *phenol sodique*, washing out a large quantity of very offensive pus. As the patient resided in the country, I could not treat the case myself, so I directed him to syringe the cavity every morning and evening with the same solution. When I saw him again, one week afterward, he was much improved, there being no pain and no unpleasant odor. On March 4th, he was very much better, the discharge at this time being slight. I directed him to dilute the medicine more and more as the disease approached a cure. On April 1st, the disease seemed to have disappeared entirely, and the cavity to be lined with mucous membrane. Probably the disease had disappeared some time previously. I directed him to keep the cavity clean by washing it frequently with warm water, and to use also a very weak solution of the *phenol sodique* once a day, to keep it sweet and pure, as food was likely to collect in it through the opening in the alveolus. As the periosteum was destroyed, there was no hope of new bone forming; so I recommended him to have an artificial denture made, (as there were several teeth missing,) with a closed tube extending into the cavity, to keep it from closing entirely; as, if it were allowed to do so, the mucous, &c., that might be there, would decompose, and renew the trouble. I saw him a few weeks ago, and as he had not followed my advice, the sides of the opening had almost come together, leaving the latter very small, and increasing the difficulty of keeping the cavity clean.

I could find no evidence of syphilis, or of the scrofulous or tuberculous diathesis, and as the man's general health was good, I was forced to conclude that this extensive caries resulted entirely from the abscess upon the canine tooth. The case exhibits the necessity of curing these abscesses before they become chronic.

Original Lectures.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

CYSTIC TUMORS OF THE MOUTH—OPERATION FOR THE REMOVAL OF RANULA.

You will recognize the patient before you to-day, gentlemen, as the one who presented herself two weeks ago suffering from a tumor developed beneath the tongue on the right of the *frœnum.* Under the belief that the tumor was, in some way, connected with the carious teeth, of which she has a number in the lower jaw, she came to the clinic for the purpose of having them removed. On the occasion of her first visit the tumor was about the size of an English walnut, and produced great discomfort by its presence—interfering both with articulation and deglutition. In order to afford her immediate relief, you will remember that the cyst was punctured at that time, evacuating a quantity of thick, transparent, extremely viscid fluid. This operation was merely palliative—the statement being made that, at some future time, another would be performed with a view to the radical cure of the affection. To-day the patient has returned for that purpose—the tumor having assumed very nearly its original proportions.

Before performing the operation, which has been determined upon in this instance, I shall speak to you briefly of the nature and treatment of tumors developed in this region, limiting my remarks to those of a cystic character and which are developed, as in the case before us, beneath the tongue. In your surgical text-books you will find that these tumors are designated by the name of Ranulæ. Ranula is the diminutive of rana, a frog, and the name was applied to these tumors because the surface resembled in appearance that of the frog's belly. Originally, this name was applied to all tumors occupying this region, and which distended, by their growth, the mucous membrane of the mouth, so as to give it the characteristic appearance. Now, however, it is limited to cystic growths, and when employed is understood to indicate a certain form.

These tumors vary in size and in position—sometimes they are permitted to attain such size as to interfere, very materially, with articulation and deglutition. In one instance it is recorded that a patient was in imminent danger of suffocation—the tumor being so large as to force back the tongue and effect closure of the glottis. They may be developed to a greater extent on one side of the *frœnum* than on the other. Occasionally they appear to occupy both sides equally. Again, they may project but slightly into the oral cavity—the greater portion of the tumor occupying the upper part of the neck—the submaxillary region; and even extending as far down as the upper border of the clavicle.

In reference to the *nature* of ranula there has long been a diversity of opinion. Ambrose Paré described it as a swelling containing "cold, moist, clammy matter, which proceeded from the brain to the tongue." Two different views have been entertained by later surgical writers. By some it was believed to be an encysted tumor. By others it was thought to be what is now designated by pathologists as a "retention cyst"—distension or dilatation of the duct of the submaxillary gland, Wharton's duct, produced by the accumulation of the secretion of the gland, owing to closure of the orifice of the duct. This closure was thought to be effected either by inflammation or by the presence of a salivary calculus.

At this time the question appears to remain unsettled, as an examination of works on surgery and pathology will show.

Paget, (*Surgical Pathology*) says: "Some ranulæ are formed by dilatation of the submaxillary duct, obstructed by calculi or otherwise; others probably by abnormal development of mucous cysts, which are formed by a dilatation of the mucous glands of the floor of the mouth, or possibly of a bursa between the muscles of the tongue."

Billroth (*Surgical Pathology*) speaks of ranulæ as the result of closure of the salivary ducts.

Rindfleisch (*Pathological Histology*) takes the same view of their formation.

Prof. Gross (*System of Surgery*) classifies ranulæ under the head of affections of the *sublingual* gland, and in this respect he differs from all other authorities. He says: "It is not difficult to conceive how ranula is produced. It is essentially an encysted tumor. The orifices of the excretory canals of the glands being closed, either by direct adhesion or by the interposition of some adventitious substance, the proper secretion, instead of passing off as fast as it is furnished, *accumulates in the interior of the organ*, causing by its pressure the absorption of a considerable portion of its substance." As you will observe, Prof. Gross describes the tumor as formed by an accumulation in the *interior* of the gland, and not in the *ducts*.

Druitt (*System of Modern Surgery*) regards ranula as a form of encysted tumor. "It was formerly supposed that ranula depended on obstruction of the Whartonian salivary duct, (duct of the submaxillary gland,) but this is not the case."

Ashhurst (*Principles and Practice of Surgery*) alludes to the opinion formerly entertained that ranula was supposed to be a dilatation of the duct of the submaxillary gland, and says: "Such is, indeed, probably the case in some instances, as when occlusion of the duct is caused by the presence of a salivary calculus; but the majority of ranulæ appear to be distinct cystic formations, analogous to those which are met with in other organs."

In connection with the opinions of recent authorities, just quoted, it will be of interest to refer to the statement of Fleischmann, (Schmidt's *Jahrbucher*, 1851, B. 42.) He describes "a pair of mucous sacs beneath the tongue upon the genio-hyo-glossi muscles, where they enter the tongue, little distant from its front edge, in the *frœnum linguœ* and behind the opening of Bartholine's duct (of sublingual gland.) They are some lines in length, very distinct, and of unequal size on the two sides, the right being generally larger than the left." Cystic degeneration of these sacs was thought by him to give rise to ranulæ.

Paget regards the existence of a bursa as a normal structure in this locality, as somewhat doubtful. If time permitted I might multiply quotations. I think, however, enough have been selected from standard authorities to show that there exists a difference of opinion, at this day, in reference to the exact nature of this affection. It may appear strange, that while other and more important questions have been determined by scientific investigations, this one, comparatively trivial in itself, should have remained undecided. This has arisen, no doubt, from the want of opportunity to conduct either anatomical or pathological observations. Chemical examination of the fluid contained in the cysts has been mainly, if not entirely, relied upon to decide their nature; and so far as can be gathered from the reports made, it would appear they confirm the opinion that ranulæ belong to the class of encysted tumors. This conclusion has been arrived at, owing to the failure to detect the presence of the characteristic constituents belonging to the secretion of either the submaxillary or sublingual glands; or more positive evidence has been adduced in finding, in large proportions, certain ingredients which normally do not enter into the composition of these secretions.

As you observed in this case, when the cyst was evacuated the fluid was clear, colorless and extremely viscid—so viscid that it would not run; this extreme viscidity is highly characteristic of mucus. Microscopic examination showed it to contain epithelial scales, oil globules and plates of cholesterine.

Dalton tells us that the saliva is a mixture of four distinct fluids, which differ from each other in their physical and chemical properties, and also in the source from which they come. The secretion of the parotid gland is clear, limpid and watery, *without the slightest viscidity.* That of the submaxillary gland possesses a *well-marked viscidity;* while that of the sublingual gland has still *a greater degree of viscidity.* There is yet another secretion which is derived from the follicles of the mucous membrane of the mouth, and this is *much more viscid* than either of the other secretions. He further states that the viscid property of the secretions of the submaxillary and sublingual glands is due to the organic principle, *ptyaline,* which bears some resemblance to albumen, but is not precisely identical with that substance, while that of mucus is due to an organic substance, *mucoscine.*

In this case the physical properties of the fluid indicate that it is not the secretion of any of the salivary glands. We, therefore, have to regard it as derived from some other source, which we conclude to be the mucous follicles or glands developed in the mucous lining membrane of the mouth. We are supported in this conclusion by the fact, now well established in pathology, that the glands developed in connection with the mucous membranes are liable to undergo cystic transformation. This tendency to cystic degeneration seems to exist at points most exposed to irritation, and in this fact we must seek the *cause.*

In thus expressing our belief in reference to the nature of these cysts, we do not deny the occurrence of cysts formed as the result of occlusion of the orifice of the ducts of either the submaxillary or sublingual glands. This form of cyst we conceive can readily occur, but we do not think they grow as large as those developed in the mucous glands.

We recognize, therefore, two forms of cysts developed in this situation, (both, as we have seen, vaguely described under the name of *ranula,*) which term, we suggest, should be abandoned—one, the dilatation of a duct, the result of occlusion, forming a *salivary retention cyst*, by which name it should be designated; the other, produced by cystic degeneration of the mucous glands of the buccal lining membrane, properly designated as a *mucous cyst.*

These different forms, we think, can be distinguished by the chemical, physical and microscopic characters of their fluid contents.

As to *treatment*, various methods have, from time to time, been employed, and with varying success. Beginning with Ambrose Paré, who used the actual cautery to open the swelling, we pass in review an array of plans of treatment—formidable in numbers, if not in effect. Among these we note puncture, cutting into the cyst and filling it with caustic and irritating materials, partial excision of the external wall with cauterization of interior of the cyst, introduction of a seton, of a bundle of lint, extirpation of the entire cyst, and, finally, opening the cyst, evacuating its contents, and introducing a small metal cylinder, with a button on each end, so as to retain it in position. Of all of these methods, that of complete extirpation of the sac is the most radical, and it is the one to be adopted in this case. Partial excision of the external wall, with effectual cauterization of the interior of the cyst, is also a good plan of treatment, but frequently requires to be repeated once or twice before a cure is accomplished.

In the operation for removal of the entire cyst it is desirable to have the co-operation of the patient, and to this end the production of anæsthesia should be dispensed with. In case of a child, or nervous female patient, it is desirable to administer an anæsthetic in order to secure perfect quiet, and avoid such an accident as on one occasion befel me, in which the patient closed her jaws suddenly and firmly upon the knife, and severed the lingual artery by burying the point into the tissues. When anæsthesia is produced, the mouth can be kept open by means of a cork, with a string attached, or, preferably, with a suitable gag, such as has been made by Mr. Kolbé, the instrument maker, of this city, at my suggestion.

Control of the tumor is obtained by hooking it up with a tenaculum, or by passing a thread through it, as employed by Prof. Pancoast; the mucous membrane is then incised over the surface of the cyst, and the latter enucleated by the handle of the scalpel.

In this way you observe I have dissected out this cyst, which is not developed in connection with the ducts of any of the salivary glands. It is, therefore, a mucous cyst, as was diagnosticated prior to the operation.

PHOSPHATE OF LIME AS A THERAPEUTICAL AGENT.

Dr. Artus, of Jena, suggests the following method of preparing this substance for administration in cases of rachitis, mollities ossium, etc.

Bones should be calcined, pulverized, and treated with hydrochloric acid, the fluid filtered, and the filtrate, which chiefly contains the phosphatic salts, treated with carbonate of soda till no preciptate falls, the precipitate being collected on silk and washed to remove the common salt.

Five or six times its weight of milk is now poured over it and it is allowed to stand for several days at a temperature of about 70° Fah. On the third day some finely-powdered milk sugar may be added; as a result of this a corresponding amount of lactic acid is formed, which aids in dissolving the phosphate of lime. After six or eight days it is diluted with water, filtered, and again reduced to a syrupy consistence by evaporation, in which form it may be administered.—*Algem. Wiener Med.-Zeit., from Med. Record.*

Leading Articles.

THE "GARDNER APPEAL CASE" AND S. S. WHITE.

The June number of the *Dental Cosmos* contains twenty-seven pages devoted to the secret history of the above, now, celebrated case. We have no doubt that every dentist will, if he has not already, read this with the most intense interest. In the past the dental profession have been so often defrauded that, naturally, a suspicion lurks around the very best intentioned efforts, but we think very few were prepared for the exposé made through the earnest and laborious efforts of Dr. White. That the work has been accomplished, and that in the most thorough manner, none, we think, will deny; and while it would have saved the profession much to have been informed of these facts months ago, it is a source of satisfaction to have the whole nefarious transaction served up to them.

We should be glad to lay before our readers this article in full, but have only room for a condensed statement. It will serve to show the character of these proceedings; but a clear idea can only be had by careful reading from beginning to close.

Dr. W. shows that "Benoni E. Gardner was a licensee of John B. Newbrough, and this suit was instituted to make an issue between the Cummings Patent and the patent of Fagen and Newbrough for iodized rubber. This issue affected only a small fraction of the dental profession, and the case owes all its notoriety to the fact that it afterward became the foundation of the collusive artifice practiced upon the United States Supreme Court, and the decree which has just been obtained sustaining the Cummings Patent against the appeal which Dr. Gardner was induced to make." Newbrough found himself embarrassed in his efforts to sustain the iodized rubber, and through the intervention of an agent of Bacon a compromise was effected on July 1st, 1869. "According to the terms, Dr. N. surrendered his patents and became a licensee of the Goodyear Vulcanite Co. Four licensees of Dr. N. were protected. It seems B. E. Gardner was not named in the agreement, but he was cared for in that it contracts for a continuous license to him in both the Goodyear and Cummings Patents. Dr. G. was 'not taken into the confidence of his friends, or fully informed of his privileges or immunities under that contract.'"

John A. Foster exhibited a copy of this agreement to Dr. White, and permitted him to take a copy of the signers and witnesses to it.

Subsequent to this, Foster came to Dr. Newbrough and stated "that the Goodyear Dental Vulcanite Co. wished to continue him (Foster) as counsel for defendant in the Gardner suit, and desired Dr. N. to pay him, and otherwise carry the case along just as if he was still defending it, and they (the Goodyear Dental Vulcanite Co.) would reimburse and pay back the whole of the cost of such defence."

"The date, September 8th, 1870, is an eventful one. The Goodyear Dental Vulcanite Company had several things to get done, and decided to put them all through in one day.

See the Record:

September 8th, 1870. Decree, referring cause to master, &c.

September 8th, 1870. Parties appeared with their counsel, and agreed that the master should report the sum of seventy-five dollars as the gain and profit.

September 8th, 1870. Final decree. Upon the coming in of the report, Benoni E. Gardner was *perpetually enjoined* from making, &c.

September 8th, 1870. Benoni E. Gardner appealed the case to the United States Supreme Court. Appeal allowed in open court, bond to be filed within ten days.

Of these four items, the first is probably a genuine result and date. *The parties*, being Josiah Bacon & Co., were fully informed of the day when that decree would be entered, and entirely unanimous about what else was to be done.

The written statement and conversation of Dr. Gardner serve us admirably at this stage of our history. Dr. G. says of the second item, that the only counsel whom he saw was Mr. Jabez Holmes, attorney for Josiah Bacon, who appeared to him on that day, and told him that he represented *the parties*. Some account was to be made out. He went with Mr. Holmes to some office. In reply to questions, he told them that he had no accounts by which to make up a statement of his profit on rubber work. Had been told that the use of it was free to him, and therefore exercised no care about it. Finally, they computed from the number of cases he remembered making, and agreed to call it seventy-five dollars.

Then Mr. Jabez Holmes told him that *the parties* had agreed to appeal the case. He avers that this was the first and only intimation of an appeal which he had ever heard, and that the absurdity of the thing was so apparent as to cause him to remind Mr. Holmes that he (Mr. H.) was attorney for the plaintiff who had just gained the case, and, therefore, could not quite understand how the party winning could reconcile themselves to solicit the defendant to appeal.

Mr. Holmes replied that it was all agreed upon between *the parties*, and a

Supreme Court decision was required to settle whether Cummings or Haering was ahead in making this invention.

Dr. Gardner is quite certain he was told this for a reason, to quiet his surprise, and he believed it. He never had any other idea of the appeal, and was satisfied with that part of the story. If his friend, Dr. Newbrough, had come thus to him, he would have consented without any condition; but as he was then dealing with strangers, he recalled the warning of Mr. Hayes, and demanded some guarantee that he should be kept safe from the present judgment and future costs. Mr. Holmes offered, as attorney for the Goodyear Dental Vulcanite Company, to give him such a guarantee. But Dr. Gardner refused to accept that, and required to have it in 'Bacon's own handwriting.' Upon receiving Mr. Holmes' promise that such a safeguard should be forthcoming, he executed the papers which were prepared, but explicitly denies having furnished any security on the bond: this bond is signed

'BENONI E. GARDNER.'
'HENRY W. GARDNER.'

The bond was filed Sept. 17th, 1870. The doctor denies having any knowledge of Gardner No. 2.

A different witness attests the signature of Henry W. Gardner. As our Dr. B. E. Gardner does not mention a second interview with Mr. Holmes, it is probable that the security Gardner was hunted up during the interval of nine days which elapsed before the filing. This is not worth mentioning, except to show that every detail of this appeal was managed and provided by the Goodyear Dental Vulcanite Company without any care to conceal their complicity.

Dr. Gardner subsequently received a letter from Josiah Bacon, Treasurer, written wholly in the hand of that gentleman, which confirmed the guarantee of Mr. Holmes.

This document, published in appendix, sets at rest every doubt about the collusive character of the appeal. Taken in connection with the contract of Dr. Newbrough, the proof is complete. In this letter the unblushing Josiah stands forth as both plaintiff and defendant in his own person; for the interest which he saddles upon Dr. Newbrough had been assigned by Newbrough to him fourteen months before!"

It seems Mr. Foster was subsequently out of favor in the Bacon councils, as he came to Philadelphia, agent of the "Ready Rubber," and made a statement that the B. E. Gardner case was a collusive one. His exact words were: "Both sides made up by Caustin Brown, and the best points against the Cummings patent left out. Caustin Brown, Esq., is the working counsel of the Goodyear Dental Vulcanite Co."

The next operation of Mr. Foster was to "conceive the brilliant idea of enhancing his gains by dealing with parties who had a real interest in the defence, and getting more pay from them. The dentists, as a body, knew nothing at all of this case." One in authority, it seems, came from Boston to New York, and said: "It is going on too flat; it looks too thin; we must have the appearance of resistance against us. Stir up the dentists; get them to give their notes; we must have a show of genuine defence."

Dr. White, not being satisfied to allow the case to go before the Supreme Court under the care of such counsel, induced an able lawyer of this city to become associate counsel in the case. This offer was accepted by the New York committee, of which Dr. W. A. Bronson was secretary. This was published in the *Cosmos* of February, and again in the last number of the DENTAL TIMES.

Mr. Foster subsequently writes: "At the request of the New York committee, and on the suggestion of the profession in Baltimore and Washington, I have associated Mr. Orville Horwitz with me, who, with Mr. Glassey, will assist me in the argument." Thus refusing the counsel of Dr. White who he had previously accepted. This was done, it seems, without the knowledge or consent of the New York committee.

Dr. White, in summing up the case, says:

> "We charge that in this case, since the settlement of the Goodyear Dental Vulcanite Company with John B. Newbrough, July, 1869, there has been no veritable *plaintiff*, because they were bound by that settlement to *give* a full license to the man whom they are, in this suit, pretending to sue for infringement. There has been no veritable *defendant*, because B. E. Gardner was licensed, and protection for him secured in Newbrough's contract.
>
> "We charge that this case has, ever since July, 1869, been collusive, and that it is a fraud upon the courts, and upon those against whom this decision is now sought to be enforced, and has never had any color of verity, except that which it obtained through the misguided efforts of those dentists who aided in giving it that semblance by their action just previous to and at the hearing."

He urges the formation of a National League as the best means to meet this case. This is decidedly our own opinion, and had this course been pursued in the beginning, all this trouble might have been avoided; for there are certainly good men and true in the profession willing and able to carry the matter honestly to a conclusion.

In the appendix we find a letter from Samuel J. Glassey, Esq., assistant counsel and partner of Gen. Foster, in which the following paragraph occurs:

> "It presents very grave questions, which I do not now propose to argue, but to state. If the statements contained in your letter are all true, and its

insinuations justified by the facts, *Foster and I are unfit and unworthy to practice our profession.* If your statements are not all true, and your insinuations are not justified, you are unfit for, and unworthy of, association with, or recognition by, honest men, in any relation of life."

We think the profession generally will accord the verdict that "Foster and I" are unfit to practice their profession, if they do not deserve something more.

One word in this connection with the grumblers in New York and elsewhere at the action of Philadelphia. The dentists in this city entered earnestly into the work in good faith. The city was very thoroughly canvassed, and a large amount in notes and some money collected, when the committee found that all was not right, and some, at least, desisted from further labor in this direction. We believe the dentists here are ready now to take an active part in any honest effort, but it must be beyond a doubt in this respect.

THE WELLS NATIONAL TESTIMONIAL FUND.

An effort is being made by the dental and medical professions to give a substantial expression to the value of the discovery of anæsthesia by Dr. Horace Wells.

The plan proposed is to raise a fund, to be contributed by the members of both professions, and this to be devoted to the benefit of his family. It is generally known that Dr. Wells' early death left them unprovided with even the most moderate means of support. Twenty-eight years have passed since this discovery was made, yet nothing up to the present time has been done to remunerate them for the incalculable good accomplished by it. It is to the discredit of both professions that this is so, and we hope that, in response to the appeal shortly to be made, every dentist will feel a personal responsibility to aid as far as possible. By thus doing he will honor himself and do justice to the memory of one of the greatest of the world's benefactors.

The gentlemen who have the matter in charge propose to send a circular to every dentist in the country, requesting contributions. These can be forwarded directly to Dr. S. S. White, treasurer of the fund, S. E. corner Twelfth and Chestnut streets, or to either of his branch depots in New York, Boston or Chicago.

We hope for a hearty response to this appeal. Let us prove that professions are not ungrateful to those who have sacrificed everything for their advancement.

Proceedings of Societies.

ANNUAL MEETING OF THE PENNSYLVANIA STATE DENTAL SOCIETY.

ERIE, Tuesday, June 3d, 1872.

The Society was called to order by the President, Dr. J. G. Templeton, of New Castle, at 10 A. M., in Walther's Hall, this city. At roll call the following members responded: A. B. Robbins, Samuel Welchens, J. G. Templeton, E. M. Pierce, M. H. Webb, M. E. Gillespie, J. D. White, H. W. Arthur, C. B. Ansart, C. D. Elliott, C. H. Bagley, W. E. Magill, F. Hickman, S. H. Guilford and J. L. Hill.

The session was opened by prayer, by Rev. A. H. Carrier, of Erie.

An address of welcome on behalf of the Lake Erie Dental Association was read by Dr. Magill, of Erie, as follows:

Mr. President and Gentlemen of the Society:— With unfeigned pleasure I greet your presence here to-day. This group of friendly faces is the fulfillment of a pleasant hope which has been with me for months. These annual gatherings do us real good. Is it not well for us to have these mutual hopes and memories? How they fraternize and unite us!

In behalf of the Lake Erie Dental Association I welcome all delegates and members from kindred associations. We bid you welcome as a band of earnest laborers in the cause of professional advancement and social culture. We know that, socially and professionally, there are direct benefits derived from these reunions; that from them we go home with modified antagonisms and more correct ideas of what is due to others; with better conceptions of our true professional work, and better ability to perform it. The effect of institutions like this is to level upwards. To sustain them is the duty, and should be the pleasure and privilege of every member of our profession.

In behalf of our citizens I welcome you as a body of intelligent men, members of a profession devoted to the prevention and amelioration of human suffering, it being one of your objects to disseminate correct information as to the best modes of preserving organs so subject to decay and so essential to health as are the natural teeth. Your advent is welcomed as that of the bearer of glad tidings, and the influence which you are thus to exert upon the public health is beyond the reach of human ken. Let us hope that it will be both great and permanent.

In behalf of this occidental region I welcome you of the orient to the shore of our inland sea. Wedded as is now our lake to your ocean—bound by bonds of iron—agriculture and manufactures have clasped hands across the interval and commerce has ratified the compact. Harmonizing in business interests, it is delightful to add the tie of social fraternity. We hope your acquaintance here will ripen into warm friendship for us and ours, and that henceforth there shall, socially and professionally, be no east, no west, but one broad bond of brotherhood embrace us all.

ACKNOWLEDGMENT.

Dr. WELCHENS, of Lancaster, for the State Society, replied as follows:

Mr. President and Gentlemen of the Pennsylvania State Dental Society:—A leading object in the organization of our State Society is to cultivate a high social standard among the members of the dental profession, and apart from the scientific exercises, these addresses of welcome, coming spontaneously as it were, from the members of one local society and extending to the members of distant societies of similar character, are among the most pleasing features of our transactions. To extend and grasp the hand of fraternal friendship across the bosom of this great commonwealth is a real guarantee of the binding efficacy of the social benefits arising from our State and local societies.

We, of the extreme east, meet the members of the profession of the extreme western portion of the State on this common platform, and whether in our social relations, or scientific discussions, we feel that an undying principle of professional courtesy and good fellowship, as a real stimulant to improvement, not only to the members of our rapidly advancing profession, but to every community in which we hold our meetings, underlies our every action.

The hospitality and cordial welcome of the dentists of Erie is not behind the extreme social greeting by which we were met at Pittsburgh two years ago, and the beautiful address of welcome to which we have just listened, attests the fact that in sociability, as well as in scientific attainments, you of the profession are not behind the most approved and most advanced attainments anywhere in the State.

GENERAL BUSINESS.

Payment of dues by members, and presentation of credentials by delegates followed, after which Dr. Robbins, Chairman of the Board of Censors, reported that the following delegates were duly accredited from their respective societies: Drs. M. H. Webb and E. T. Darby, from the Odontographic Society; Drs. G. W. Klump and David Dieffenbacher, from the Susquehanna Association; Drs. George Elliott, J. H. Nelson, W. B. Naramore, G. W. Nelson and E. R. Allen, from the Lake Erie Association, and Dr. S. Atlee Bockius, from the Harris Dental Association.

The report was accepted.

Doctors Darby, Klump, Dieffenbacher, G. Elliott, J. H. Nelson, G. W. Nelson, Bockius, Naramore and Allen, having signed the Constitution and paid their dues, were admitted as members of the Society.

On motion of Dr. ROBBINS, Dr. Smedley, of Denver, Colorado, was invited to take a seat with and participate in the discussions of the Society.

The Secretary then read the minutes of last year's session, which, on motion of Dr. WELCHENS, were approved.

Dr. WELCHENS, Chairman of Publication Committee, reported that the transactions of the Society, from its foundation to the close of the last session, had been published in a pamphlet of 144 pages; that the errors it contains had all been corrected in the proof, but had not been remedied by the printer;

that the total expense to the Committee was $174.50; credit, $124; leaving a balance due the Committee of $50.50.

Report accepted and Committee discharged.

Dr. Robbins reported as follows:

To the Pennsylvania State Dental Society:

Gentlemen:—Your Committee appointed to procure the change of name of the Society from "The State Dental Society of Pennsylvania" to the "Pennsylvania State Dental Society," did prepare a bill amending the charter as proposed, and also changing the time of holding annual meetings, from the second Tuesday in June to such time as shall be determined by the By-Laws.

The bill was passed and approved.

A. B. Robbins, *Chairman Committee.*

Dr. Welchens, as ex-member of the Committee to Revise the Constitution, reported that, as no legislative action had been secured last winter, the Committee did not act.

Dr. Robbins, for the Committee on Legislative Action, reported failure, and moved that this subject be made the special order of business for Wednesday morning, immediately after the reading of the minutes.

The motion was agreed to.

Dr. Magill, for the Executive Committee, reported as follows: "That the daily morning session be from 9 o'clock, A. M., to 12, M. Afternoon session from 2, P. M., to 6, P. M. Clinic, if any, at 8, A. M., or from 11, A. M., to 1, P. M., by adjournment of morning session. Wednesday afternoon adjourn at 4, P. M., for an excursion on the bay. The evening to be devoted to social amusement. Thursday evening, public address in Walther's Hall, if the Society so decide."

W. E. Magill,
E. M. Pierce, } *Executive Committee.*

The report was adopted, and Society adjourned until 2, P. M.

AFTERNOON SESSION.

The Association was called to order again at 2 o'clock, P. M.

The Censors reported that credentials of Drs. G. W. Nelson, D. P. Stewart and John Murray, from the Lake Erie Association had been examined and found correct, and, on motion, these gentlemen were admitted to membership.

Dr. Gillespie, the Vice-President, then took the chair while Dr. Templeton delivered the President's annual address, as follows:

ADDRESS BY DR. TEMPLETON.

Gentlemen of the Pennsylvania State Dental Society:—In accordance with an established custom, it now becomes my duty, as your presiding officer, to deliver, or rather read an address, which I shall endeavor to do, though poorly and imperfectly, but earnestly and briefly as possible.

Another year has been numbered with the past since we met together in friendly concert at Gettysburg to discuss such subjects as might be brought before us, having for their object our mutual improvement and the advancement of dentistry in the State of Pennsylvania, and, as we trust, resulting in great good to those for whom we labor. Let us be thankful that, in the good providence of God, the author of our existence and the preserver of our lives, we are again permitted to meet together for the same purpose, and let us renew the social ties that should always bind together those having a common professional interest. This Society may be considered the legislative body governing our professional interests throughout the State, and as such it comes within its province to recommend to local associations the adoption of a standard of qualification for the admission of members; and it is also its duty to take the initiative in any advance movement for the benefit of the profession, all progress having for its object the acquisition of such knowledge as shall ultimate to the good of the people. Suppose we ask the question, "What is most needed by the people at large throughout our State at the present time?"

We think that every progressive dentist would answer that they need to know, and be instructed to appreciate what dentistry is, and what it is capable of doing, to ameliorate the condition of mankind. As to what would be the best method of imparting this important knowledge, would be a proper subject for discussion in this Society. The first step in this direction would be the education of the profession to appreciate the advantages of associative effort. While there are many dentists in the State who do not need such training, yet when we take into account the mass of the profession in our State, a large majority of them are of that class who seem to know enough already, who never attend any association. From such we have frequently heard the following remark: "Oh, I don't care much about going to these meetings. I can read the proceedings afterward in the journals."

If all were of this opinion, would there be any proceedings published for them to read? Visit the offices of such men, and many of them will try to convince you that the profession is greatly indebted to them, for many very valuable things, and that they are even now incubating something of vast importance in dentistry that will astonish the incredulous world.

"Lo! he put in his thumb and pulled out a plum, and cried what a wonderful boy am I." All such men are an incubus on the profession, retarding its progress more than barnacles do the ship to which they are attached, and unless we can educate the people by some means, we cannot expect a very rapid diminution of this class of practitioners.

"If we would properly comprehend the profession to which we belong, our hearts must, morally and mentally, reach out beyond personal interests. Nor does it lie in the conception of bigots to see the grasp of beauty in beneficence, grandeur of truth told, and the majesty of right proclaimed."

The dentist should be a man thoroughly educated in the theory and practice of his profession, such as can be obtained at our dental colleges; and in our humble opinion, no number of years of practice alone can be equivalent to even one systematic course of lectures in a well-regulated dental college, where theory is taught in combination with practice. "Theory is science as distinguished from art—it is to art what the mind is to the hands; alone leading to no practical results, but combined with art, producing superior intelligent action."

The question: "Is science useful to industry?" has often been agitated, and, unhappily, many engaged in the various branches of industry still need to be convinced that without science, success in their pursuits is impossible. It is a failing of Americans to aim at practical results by a shorter process than that conducting through theoretical knowledge. We admit that a man following recipes and directions, as the automaton does the movement of wheels, may accomplish certain results. He is informed, by his recipe, that to obtain a certain result he must mix a fixed quantity of one substance with a certain quantity of another. Why the result follows he does not know. It is work without reason, practice without theory and science. He may succeed ninty-nine times and fail the hundredth, since he has only chance for his guide. He may work for years without knowing whether modifications might not furnish a better result, while a scientific man will not use a formula without first ascertaining if it cannot be improved, and if he encounters difficulties, he can overcome them, for he will know where the trouble is. Success will attend *his* operations, and instead of being diminished, will be increased, and will amply repay the expense necessary in acquiring the knowledge so valuable of science applied to industry, or theory combined with practice.

You are aware that all efforts that have heretofore been made for the purpose of securing legal recognition and protection, have been unsuccessful so far as obtaining the object desired, though not without some good results in the way of agitation and awakening the attention of the people. The necessity of a law for the protection, primarily of the people, from the hands of the empiric and unqualified, secondarily for the protection of the true dental profession from the evil influences accruing from the same, is so apparent as scarcely to require mention. In regard to the first, let the many thousands of cases of irreparable mutilation and of intense suffering, in many instances bringing the sufferers to an untimely death, testify. Oh! that such cases could speak with trumpet tongues, to ring through all the land the wrongs and outrages committed. Our legislators would then hasten as one man to grant the needed law. We have seen malpractices by those professing to be dentists, that ought to have consigned the perpetrators to a prison, if not a worse fate.

Perhaps this may be considered as an extreme view. Could we bring the witnesses upon the stand, we could prove it beyond the possibility of cavil, to be a mild view. Shall men, women and tender children be marred and mutilated and rendered miserable for life by having the beautiful and symmetrical human face, through which the soul shines and speaks, transformed into a deformed and unsightly thing, through which the soul refuses to give its correct utterance? Many of these incompetents are itinerating through this State, committing their depredations wherever an opportunity offers, without let or hindrance. Knowledge on the part of the people would remedy this as well as many other evils; but that will be the work of years, and to meet the difficulty, in the meantime, something else must be done, and what can we have better than stringent legislation? It has been said that the proper education of the dentist would remedy the difficulty. This would only accomplish the object when all men become honest, and when every one who chooses to enter the ranks of the profession can be trained to the possession of the requisite ability to perform its responsible duties. The objection has been argued, that such a law would be oppressive upon many honorable and well-meaning practitioners, who have not enjoyed the advantages now open to the student, and consequently are inefficient in their knowledge of many details. Laws are made for the transgressors of the right, and the law we wish to have enacted should be such as would be restraining to the dishonest and incompetent. If we decide to pursue this matter further—and I cannot see why we should be discouraged when patience and perseverance is sure to gain us our object—the work then lies at the door of every honorable practitioner in the State, and does any one ask "what can I do?" We answer:

First. By all proper means and opportunities endeavor to create a right public opinion on the subject.

Second. Let no legislator, either Senator or Representative, go up from any part of the State on the first of January, without fully understanding the subject in all its bearings. Let all questions and objections be as fully answered as possible, that they may be able to act understandingly and promptly.

In conclusion, allow me to thank you for the distinguished position which you gave me at your last annual meeting, hoping that I may prove myself worthy of the honor conferred upon me.

Reports from delegates to the American Dental Association having been called for, Dr. McDonneld said that the discussions had been more on theoretical than practical points, but that some new instruments had been exhibited, viz: The Morrison Dental Engine, the Green's Pneumatic Engine, and Johnston Bro.'s Condensed Nitrous Oxide. That these engines were used in the clinics, and the Morrison much preferred; that the condensed nitrous oxide was very satisfactory as an anæsthetic.

The delegate to the Ohio State Dental Society, Dr. Templeton, then reported at length, referring especially to the new features introduced by that Society at its last meeting, viz: The devoting of half or three-quarters of an hour twice a day to a quiz, which evolved much interesting and practical information. Also, the appointment of two clinical teachers at each annual meeting to give practical instructions whenever a sufficient number in any locality should ask for it; those who were instructed paying expenses and a salary. Also, that Dr. Taft was appointed delegate to the Pennsylvania Society. Also, that Dr. Watt often corrected irregularity of teeth by cutting notches to fit the teeth, in pieces of old ramrods, and instructing the children to press with and bite on these sticks. And that by the use of a new non-explosive vulcanizer, rubber could be vulcanized on a gold plate, without aid of pins or perforations, so firmly that a graver was required to separate them.

Dr. Magill moved that an invitation be extended to the dentists and physicians of this city to attend the meetings of this Association, and that it be understood that the Society sits with open doors.

On motion of Dr. McDonneld, it was decided that an order be drawn on the Treasurer for $50.50 in favor of the Publication Committee.

Dr. McDonneld then moved that a committee of three be appointed to fix the price of the printed copies of the "Transactions."

Dr. G. Elliott moved to amend by retaining Publication Committee. Motion as amended lost.

Motion renewed by Dr. McDonneld, to appoint committee of three to dispose of subject, then prevailed. President appointed Drs. McDonneld, Magill and Klump.

Credentials of Dr. Wallace, of Kingsville, were accepted.

Dr. Robbins moved to amend Article IV, Section 1, of Constitution, so as to read, "The Society shall hold an annual meeting at such time as the By-Laws shall provide." Carried. Also, that Article I be so amended as to read, "The name of this organization shall be 'The Pennsylvania State Dental Society,'" to conform with our amended charter. Also, that Publication Committee be instructed to publish amended charter with next volume of transactions. Carried.

On motion of Dr. Welchens, the Committee of last year, to Revise Constitution, was continued. Members: Drs. Robbins, Welchens, McCalla, Amer, Hoffer.

Dr. Robbins moved that at the close of our third day's session, we adjourn to meet on the first Tuesday of June, 1873. Dr. Welchens amended time to second Tuesday of July. After discussion, amendment sustained, and time fixed for July, 1873. The City of Lancaster was then selected as place of next annual meeting, on motion of Dr. C. D. Elliott, of Franklin.

A committee to make nominations was then appointed—one member from each local society represented here, as follows:

Dr. Robbins, Lake Erie Dental Association.
Dr. Hickman, Harris Dental Association.
Dr. White, Pittsburgh Dental Association.
Dr. Klump, Susquehanna Dental Association.
Dr. Darby, Odontographic Society.
Dr. Guilford, Lebanon Valley Dental Association.

On motion, Dr. Darby was elected to deliver the public address next year.

Dr. Allen moved that the clinic be held at 8, A. M., Wednesday, but withdrew the motion, and changed the hour to 11, and the motion prevailed.

Dr. Gillespie moved that the Secretary be allowed a yearly compensation of $25. Carried.

The Nominating Committee reported as follows:

President—M. E. Gillespie, of Pittsburgh.
First Vice-President—W. E. Magill, of Erie.
Second Vice-President—H. W. Arthur, of Allegheny.
Recording Secretary—C. B. Ansart, of Oil City.
Assistant Recording Secretary—S. H. Guilford, of Lebanon.

Corresponding Secretary—S. Welchens, of Lancaster.

Treasurer—J. McCalla, of Lancaster.

Censors—A. B. Robbins, T. Hickman, J. G. Templeton, M. H. Webb, E. T. Darby.

All the nominations were accepted by ballot, and the officers as above declared duly elected.

Adjourned to meet in hotel parlor Tuesday evening, at 8 o'clock, for the purpose of holding a "quiz."

WEDNESDAY MORNING.

Association convened at 9 A. M. After roll call and reading of minutes, the following gentlemen were appointed delegates to the American Dental Association: Drs. Pierce, C. D. Elliot, H. W. Arthur, J. L. Hill, S. Davis, E. R. Allen, J. G. Templeton, M. E. Gillespie, John Murray, G. W. Klump.

On motion of Dr. Robbins, the President and Secretary were authorized to fill any vacancies which may exist in the delegation at the time of the meeting of the American Association.

On motion of Dr. Robbins, Drs. Ansart and Wallace were appointed delegates to the Ohio State Dental Society, and Dr. M. H. Webb a delegate to the New York State Dental Society.

Censors reported having received, examined and approved the credentials of Drs. S. Davis, J. C. Gifford and S. W. Tenney, from the Lake Erie Association, who were thereupon admitted to membership.

Dr. Robbins, as chairman of the Committee on Legislative Action, then reported as follows:

REPORT OF THE COMMITTEE ON LEGISLATIVE ACTION.

Gentlemen of the Pennsylvania State Dental Society:—Your committee appointed to procure Legislative action to secure the passage of a law to "Improve and regulate the practice of Dentists in the State of Pennsylvania," respectfully report, that as Senator Warfel, of Lancaster, having had charge of the bill the previous session, and having expressed a willingness and desire to again undertake to secure the passage of the proposed bill, your committee deem it wise to entrust him with it, and accordingly a part of the committee again prepared a bill, with some immaterial changes, similar to the one published on page 85 of Transactions, in section 1, inserting 1875 for 1874; in section 3, authorizing the collection of $5 from each applicant examined, and the additional sum authorized by the State Society, not exceeding $25, from each one receiving a certificate of qualification; in section 4, striking out the maximum sum of $200, leaving it discretionary with the court; in section 5, omitting the words "Of quarterly sessions." Thus making the bill conform to the experience of the Ohio State Dental Society, and removing objections made to the previous bill. To a correct understanding of the efforts made to secure the passage of the law and some of the causes of failure, permit us to state that the dentists in many localities circulated petitions that were prepared at the suggestion of Dr. Martin, by the Susquehanna Society, and had many of the members of the Senate and House pledged to its support, and the chairman found a very good feeling among the representatives, but the co-operation of the committee, as expected, was not secured, owing to the sickness in Dr. Robbins' family preventing the first meeting, and at the second meeting the illness of Dr. Martin; but that the chairman placed the bill in charge of Senator Warfel, and notified Drs. Martin and McCalla of his action; but for some unexplained reason, Dr. Martin, when visiting Harrisburg to aid its passage, called upon Dr. Gray of the House, and not upon Mr. Warfel of the Senate, and left, thinking the bill was not in possession of the Legislature, and that owing to the absence of Mr. White, Chairman of the Judiciary Committee, to whom the bill had been referred, the bill was locked up, and when subsequently urged to report the bill, refused to do so except negatively, and it was then too late to commence anew in the House, although assured by Dr. Gray that if the bill could reach him from the Senate he could secure its passage.

A. B. Robbins, *Chairman.*

Discussion followed the reading of the report, in the course of which Dr. Templeton, to show the importance of obtaining such a law as was proposed, read a newspaper extract concerning a case of malpractice in Pittsburgh, in which a dentist is charged with having removed an entire row of front teeth, instead of two, as it is claimed the applicant called for, while under the influence of laughing gas.

Dr. Robbins thinks the State Society not yet sufficiently aroused to the necessity for this law. All the petitions for its passage have emanated from the Susquehanna Society. The law is for the benefit of both the profession and the community, and not for the aggrandizement of the Dental Colleges.

Dr. Klump said the first petitions came from the local society at Williamsport.

Dr. G. Elliott thinks it would be a good plan to have petitions emanating from the State Society in the office of each member, for signature by their patients.

Dr. Dieffenbacher showed the petition to the members of the Legislature from his district, who told him to get signers. He circulated it, and found only one person who refused to sign.

Dr. J. C. Gifford said that each local society in New York was addressed on this subject, a conference held, petitions furnished each local society, and each dentist supplied with a petition and circular letter asking him to classify the names of signers, getting first the physicians' names together, then the clergy, bankers, lawyers, &c., thus giving greater power to the petition. The result was success.

Dr. Magill saw no difficulty in getting names. The only surprise expressed by intelligent men was that no such legislation already existed. But these matters are managed by legislative log-rolling. It is the difficulty of getting rid of local influences that prevents the passage of such laws. It must come through personally influencing members of legislature more than through petitions, although these make a good ground-work on which to act. We should appoint our own committees to act in each county to influence the members of Legislature. Political influence is the lever which must be brought to bear.

Dr. GIFFORD said that, in addition to the petitions in New York State, men were appointed in each district to confer with the members of the Legislature.

Dr. TEMPLETON suggested that these foregoing remarks be considered as instructions to the committee. He objects to the ten year clause. Thinks that the old and competent practitioners would not object to coming before the Board of Examiners. As the bill now stands, many very incompetent men would escape.

On motion of Dr. WELCHENS the report was accepted.

On motion of Dr. C. D. ELLIOTT, Drs. Robbins, McCalla, Martin and McDonneld were appointed a committee to procure legislative action.

Dr. WELCHENS offered the following resolution, which was adopted:

Resolved, That the individual members of the Pennsylvania State Dental Society earnestly exercise all their influence in their respective communities, both in and outside of the profession, to sustain the committee on legislation, and do their utmost toward procuring such law.

Dr. WELCHENS offered the following resolution:

Resolved, To amend Article VIII of the Constitution, so as to substitute three dollars as an annual assessment for regular members, and four dollars for initiation of delegates as new members.

Laid over till next year.

Also, to amend Article VI, Section 3, to read—"He shall perform such other duties as custom or the Society may require, and shall receive a salary of at least twenty-five dollars for such services, and shall have an assistant elected," &c.

Laid over till next year.

Mr. RUBY, representing the Buffalo Dental Manufacturing Company, exhibited Elliott's Burring Engine. It is worked by a cord passing over a double pulley, half way to the ceiling and thence to a window casing, where a weight balances and keeps the cord tense. When not in use it can be pushed up out of the way. It is a stationary engine.

Dr. ROBBINS exhibited an exploring instrument of Dr. Howes, of New York.

Dr. ROBBINS offered the following resolution, which was adopted:

Resolved, To instruct the Committee on Revision of Constitution and By-laws to provide for honorary membership of suitable persons.

Dr. MAGILL, for Committee on Published Transactions, offered the following report:

Your committee appointed to report on the best mode of disposing of copies of the Transactions, find the

Number of copies printed, ...	500
Number of copies on hand, ...	380
Cost of 500 copies, ...	$165 00
Cost of sundries, ...	9 00
	$174 00

Realized from advertising, ...	$72 00
Realized from sales, ...	12 00
Realized from society funds, ...	40 00
	$124 00

Balance unpaid, $50 00.

The committee recommend that single copies of the Transactions be sold, as heretofore, at forty cents, and that those who will buy and distribute four or more copies, can have them at cost, namely—25 cents. They also recommend that any money remaining in the treasury, after paying necessary expenses of present session, be appropriated toward payment of balance due for printing Transactions.

G. B. McDonneld, } *Committee.*
W. E. Magill, }

On motion of Dr. Robbins, the report was accepted and committee discharged.

The committee then adjourned to attend clinic.

The operation was performed by Dr. Darby, of Philadelphia, who filled a large compound cavity occupying the anterior approximal and masticating surfaces of an inferior molar tooth, employing Bonwill's electric mallet plugger, using forty grains of gold and occupying less than three-quarters of an hour. The result was very satisfactory.

WEDNESDAY AFTERNOON.

Called to order at 2.30 P. M. Roll call and reading of minutes.

Dr. Huey, the first essayist, being absent, the subject of his essay, "Discolored Teeth and their Treatment," was taken up for discussion.

Dr. Klump bleaches by cleansing thoroughly, filling one-third of root with gold, applying chloride of lime and acetic acid, closing cavity and depending on the chlorine to bleach the tooth.

Dr. Wallace has not had extensive experience in the matter. A healthy system is necessary to success. Has had some cases of discolor by blood; tries to get the patient and the parts adjoining the tooth into a good state of health, but did not do much else.

Dr. Magill has had but few cases. Always used the chloride of lime and chloride of zinc mixed; always guarded the foramen of the tooth, and watched the case carefully; thinks it advantageous to secure some pressure by cotton and gum; related a case treated by Dr. Smedley, relieved temporarily, but discoloration returned, and asked the reason for the return.

Dr. Smedley said the tooth was dead, and had been filled with amalgam; thinks the discoloration was the result of both causes; he bleached and filled it with gold; in a short time the tooth was as dark as before. What is the reason?

Dr. Robbins said such cases sometimes occur because the root is not sufficiently well filled. But this does not explain every case. Many teeth appear to have been partially disintegrated, and the place of the removed material filled by other material, which decomposes and discolors. Some discolorations can be removed by excavation, others by application of chalk, which will take up discoloring matter, and can then be removed. Such cases are permanent. In others we must use chlorine or acids, and such cases are more doubtful. Thinks dentists cannot always close the root sufficiently with gold. Thinks sometimes we get chloride of gold so as to discolor the tooth. Would be well to cover the gold with oxychloride of zinc before using chloride of lime. Thinks sometimes discoloring matter comes through disintegrated teeth from the gums. Sometimes minute holes are made through the teeth with instruments, which allows matter to enter. Must be careful not to use too powerful agents, and not to cut away too much tooth substance. There is a very subtle and insidious agent which discolors teeth, with which we are not yet acquainted, and which sometimes renders all our efforts futile.

Dr. **GILLESPIE** had a case where the root, when opened, was found to be dry, with little or no odor. The tooth had received a blow some time before, and soon after began to discolor. Thinks that the vitality was so reduced, that having been injected with red blood, the coloring matter was absorbed but not taken up, and an oxide of iron seems to be left.

Dr. **DARBY** had a case of two lateral incisors, discolored after an application of arsenic by another practitioner. Thought that he had succeeded several times, but the discoloration returned, and finally he cut off the teeth and inserted artificial teeth. Thinks the best plan generally is to remove as much of the discolored denture as practicable, fill the body of the tooth with oxychloride of zinc, and cover with gold.

Discussion closed.

The next essayist, Dr. **NEIDICH**, being absent, his subject, "Absorption of Alveolar Processes," was opened for discussion.

Dr. **MAGILL** had a case caused apparently by loss of the antagonizing tooth. The absorption extended to extremity of the buccal roots. The tooth gradually turned toward the palatine arch.

Dr. **TENNEY** saw a case where, after the teeth had been extracted, the process was entirely absorbed, so that the ridge had entirely disappeared.

Dr. **KLUMP** had a patient who took unusually good care of her teeth, but had absorption of gums and alveolar process around most of her teeth; could not explain it; was but little tartar; gums were healthy; no discharge from the gums.

Dr. **DIEFFENBACHER** had a case where a lady had thirty-two sound teeth, but were so loose that they rattled when she shook her head; could extract some of them with his fingers; was a red line around the teeth, tartar and very offensive odor from the saliva and mucus, and discharge from around the roots. He extracted the teeth, and the lady's health was much improved.

Dr. **MAGILL** asks if we often enough undertake constitutional treatment in such cases. We have not had so much experience of that kind as we should have had. We need training and education in this direction. We cannot expect the general practitioner to cover our ground. The disease which gives us so much trouble in this section, for which we have no name, and about which physicians know nothing, shows the direction in which we need education ; that there is something needed beyond filling teeth and making plates ; advocates advancement in dental medicine. The young men of the profession are those to whom we must look for discovery and knowledge in these matters. This is one of the results for which we hope from dental legislation.

Dr. GUILFORD thinks absorption results from hereditary disease, constitutional debility, or accumulation of tartar. In first two cases would refer patients to physicians. Thinks the accumulation of tartar often results from drinking alkaline water. Had such a case of a young man who had spent some time on the western plains, and used the alkaline water there.

Dr. ROBBINS.—Our physicians are not specialists in these cases. Dentists should be so qualified as to give suggestions and advice to physicians in these cases, without which he would not give much for any benefit to be derived from the physicians, who are generally quite ignorant in this direction. Dr. Atkinson once said that he could restore alveolar processes if he could have a pocket to hold the plasma. As far as he can bring down the gum by granulation, so far he can restore the process, and has done it. An important point to consider is, how to hasten absorption of the process after extraction of teeth. Some dentists clip off the bone with nippers quite close, allowing the flap of gum to come over the wound, and then by fitting the plate very closely, having carved the plaster, the gold plates were inserted in a very short time, and by perseverance on the part of the patient, absorption soon takes place. The disease referred to by Dr. Magill is, to a certain extent, local.

Further discussion of the subject was postponed until Thursday morning.

THURSDAY MORNING.

Convention was called to order at 9 o'clock, A. M. After roll call and reading of minutes, Dr. WELCHENS urged the choice of an editor to take charge of the publication of the transactions of the Society; when the matter is in the hands of a committee, much delay is caused and time lost. The subject of absorption of alveolar processes was again taken up for discussion.

Dr. MAGILL.—There must be general principles underlying this subject which we should fathom. Why does absorption take place after extraction? When there is no longer use for an organ it is removed. There is a change of action in the vessels of the part. What the fluid may be which breaks down the structure we do not know, nor what should excite the absorbents to action, any more than we can explain the absorption of deciduous teeth, where we have first developments, then absorption and redevelopment without further absorption. It is wonderful, but as yet unexplained. We have here a wide field for investigation and discovery. Important cases are, where there is extensive absorption around long and not very firmly-set teeth, with turgid gums and not much accumulation of tartar. By the persevering application of a solution of chloride of zinc, although we do not produce new process, we hold what we have, and the teeth are tightened and the case improved. It may return in six months as bad as ever; but we will find it more amenable to treatment than before, which should encourage us to per-severe with this or other curative agents. We should cultivate these cases. The most common cause of absorption is undoubtedly the accumulation of tartar. We are not usually careful enough in removing it. It can now be very thoroughly accomplished by the aid of the greatly-improved scalers now made.

Dr. G. ELLIOTT related the case of a lady who, for seventeen years, had had only the six front teeth in her upper jaw, and they were as loose as the fingers on the hand. Had filled one of those teeth two years before and two of them since. The process was almost entirely absorbed, yet the teeth remain in place. This case encourages him to attempt the treatment and preservation of such teeth.

Dr. KLUMP.—This is a subject of vital importance to the community. Dentists know little about it, and physicians less. Had seen many cases treated for scurvy by physicians which were remedied simply by the removal of tartar. Thinks that the patient whom he mentioned yesterday caused the absorption by too much brushing and too much care of her teeth. Many cases are caused by mercurial salivation. Operated on one case which the physician in charge thought was caused by mercury, and removed the greater portion of the superior maxillary bone. Has always been careful not to allow chloride of zinc to touch the alveolus, thinking that it would cause absorption, but was glad to know that others had used it with success. Does not think that hereditary taint has often much to do with this disease.

Dr. BOCKIUS does not agree with the last speaker. Thinks that in nine cases out of ten, where we cannot assign a definite cause, it is owing to hereditary taint.

Dr. KLUMP has watched some of these inexplicable cases, but as he found that some members of the same family were affected while others escaped, he could not attribute it to hereditary taint. If all the members of a family were affected, this cause might be assigned.

Dr. WELCHENS.—As patients advance in years, such cases may occur from the weakening of the vital forces and the failure of the nutritive powers. Related cases where this was the only cause which he could assign.

Dr. G. ELLIOTT thinks that in these cases it would be well to find out the mode of life of the patients. The trouble may be caused by fondness for certain articles of food, and by a change of habits we may remedy the trouble. Exclusive use of certain articles of food may give ascendancy to certain fluids of the mouth, which would cause the absorption.

Discussion closed.

Dr. GILLESPIE being called on, read his essay on

DENTAL ETHICS.

Defining ethics as moral philosophy, but having more to do with action than thought. Dental ethics, however, was narrowed down to three legitimate and specific objects, viz: The dentist himself, the profession and his patrons. The essayist then discussed at length these three objects and their relations to each other, finally urging that our efforts in life should be purity of heart, nobleness of purpose and lofty aims, which will work out their effects upon our persons and lives.

Dr. ROBBINS followed with remarks, in which he deprecated the disparagement to patients of one dentist by another, and herefrom moved that the code of ethics of the American Dental Association be published in connection with the essay which has just been read.

The motion was adopted.

Dr. MAGILL.—When a new dentist comes to settle in a town, does etiquette require that he should call on the resident dentists, or should they visit him first?

Dr. ROBBINS thinks this should depend on circumstances. Is not sure that we are always obliged to do professionally what would be required of us socially. We may have such knowledge of the man that we could not, without stooping too much, acknowledge him. On the other hand, the new comer may bring such evidence as would at once establish his character, and it would be perfectly proper for him to call on the profession first.

Dr. G. ELLIOTT thinks we should take all members of the profession by the hand, and if we find any unworthy try to improve them; if they are incorrigible, we can drop them. Social intercourse will do no harm. If we find that we have clasped an unclean hand, we can cleanse our own afterward.

Dr. C. D. ELLIOTT thinks that dentists often neglect their own teeth to such an extent as to render them offensive to their patients.

Dr. McDONNELD strongly condemned the habit of disparagement common among dentists. Thinks social intercourse one of the greatest levers for breaking down this habit.

Dr. PIERCE thinks that when we are expressing an opinion concerning the work of others, we should be honest and tell the truth; for we should protect our patients from those who have neither the knowledge or ability to do the work they are so ready to undertake.

Dr. McDONNELD explained that he would give an honest, unbiassed opinion, but would exercise charity. Must take all by the hand and try to elevate them.

Dr. TENNEY thinks that if a man has been practicing for twenty-five years, without improvement, that he is a hopeless case.

Dr. BOCKIUS has found, by experience among the dentists of Lancaster county, that social intercourse has done more toward elevating the standard of the profession than anything else.

Dr. McDONNELD showed, by the relating of his own experience, the necessity for taking every dentist into the Association, no matter how ignorant he may be.

Dr. ANSART asked what should be done with a dentist who thinks that pure carbonic acid gas is a good anæsthetic?

Dr. McDONNELD that we should take him by the hand and try to elevate him.

Dr. ANSART thinks that the only way to do so would be to give him a good dose of this same gas. Discussion closed.

Dr. Robbins moved that the session be extended to 12.30, P. M. Carried.

Dr. G. Elliott offered the following resolution, which was carried:

Resolved, That a committee be appointed to draft a petition to the Legislature, to be printed, and one copy to be sent to each dentist who is a member of any of the local societies of the State, to be signed by those favoring the passage of a State law, and that Dr. Klump be one of the committee, and that he be advised to have a sufficient number printed as above stated.

Dr. Robbins suggested that these petitions be sent to Dr. Martin, of Williamsport. Adopted.

Dr. Robbins moved a vote a thanks to the Publication Committee for their services in preparing the transactions for publication. Carried.

Also, that Dr. Bagley be presented with ten copies for his services in the same business, and that the same number be donated to Dr. Welchens for the same reason. Carried.

Dr. Ansart moved that the essayists for next year be instructed to have their essays finished before the opening of the session. Carried.

Dr. Magill, for the Executive Committee, offered the following report:

The Executive Committee recommend that a public address be delivered by Dr. E. T. Darby, Philadelphia, and that the subjects for discussion be as follows:

"Discolored Teath and Treatment," essayist, R. Huey, D. D. S., Philadelphia; "Dental Nutrition," Dr. G. T. Barker; "Mechanical Dentistry," Dr. J. D. White, Pittsburgh; "Improvements in Operative Dentistry," F. Hickman, D. D. S., Reading, Pa.; "Treatment of Dental Irregularities," S. H. Guilford, D. D. S., Lebanon, Pa.; "Dental Medicine," George Elliott, D. D. S., Meadville, Pa. And suggested that as our time is always limited, the essayists make it an especial object to treat these subjects pointedly and without redundant words; and that they have their essays fully prepared before the meeting of the Society, and if they are not able to be present, to send their essays to the Secretary or some friend, that they may be read before the society.

W. E. Magill,
E. M. Pierce,
G. B. McDonneld, } *Committee.*

The President appointed the following members as Executive Committee for the ensuing year: Drs. McCalla, Webb, Bockius, Ames and Guilford.

As Publication Committee—Drs. Ansart, Welchens, McCalla, Bagley, Klump, Barker and Hoffer.

Dr. Robbins moved that an order be drawn on the Treasurer for $25, for use of hall. Carried.

Also, that an order be drawn on the Treasurer for $26.50 for Secretary's services and bill rendered. Carried.

Also, that an order be drawn on the Treasurer, in favor of the Publication Committee, sufficient to cover their expenses. Carried.

Also, that a vote of thanks be extended to the editors of the Erie *Dispatch* for the full report given in their paper of the proceedings of this Society. Carried.

On motion, a vote of thanks was extended to the Lake Erie Dental Association for the excursion on the Lake, enjoyed by the Society, on Wednesday afternoon. Carried.

Dr. PIERCE moved that a vote of thanks be extended to Mrs. Dr. Magill for the very pleasant entertainment given to the Society at her house on Wednesday evening. Carried.

Dr. ROBBINS offered the following resolution, which was adopted.

Resolved, That Section 4 of the By-Laws be amended to read as follows: The annual meeting of this Society shall be on the second Tuesday of July, the session to continue such time as the Society may determine from time to time.

Adjourned until afternoon.

THURSDAY AFTERNOON.

Called to order at 2 o'clock.

After reading of the minutes, Dr. WELCHENS moved that we adopt as a precedent the rule not to appoint as essayist any one who has failed to bring his essay, or send an excuse. Carried.

Dr. McDONNELD then read his essay on "Operative Dentistry," congratulating the profession upon the advancement which has been made; advising eclectic practice; describing the method of using Dr. Jack's matrices; bestowing high praise on the Morrison Engine and Barnum's Rubber Dam, &c.

The subject was then opened for discussion.

Dr. TEMPLETON, at the request of Dr. Robbins, referred to the use of broken points. One day, while filling a tooth twenty-eight years ago, Dr. Robbins broke his plugger, and not having time to repoint it, used the broken point and found it better than it was before. Afterward broke others purposely. Dr. Atkinson, who then practiced in Meadville, told him that he had had the same experience.

Dr. GUILFORD thinks the gold in approximal cavities of molars and bicuspids should be first pressed directly down on the cervical wall, and not against the buccal or lingual wall first, as advocated by the essayist. When the walls are standing around large crown cavities in lower molars, he prefers to use soft foil cylinders, set on end, to fill the most of the cavity, and then finishes with adhesive gold.

Dr. MAGILL, when using foil, prefers to fold it, so that the plain surface coming together shall more easily be condensed into a solid filling. Foil twisted into rope encloses air, and requires more time and force for equal condensation. It is possible, in large cavities, to make a filling too dense with adhesive gold, so that expansion of the metal by sudden heat may burst the tooth. In some fillings cylinders and soft foil are preferable.

Dr. WEBB folds gold on spunk in preference to a napkin. When pivoting teeth, thinks it best to carry the gold when filling around a gold box inserted in pulp cavity beyond the margin of root, and let the pivot tooth rest on this filling. Uses semi-adhesive foil generally. Described an interesting case. Filling a superior central incisor, two-thirds of which had been broken off by a fall three years before. The root was in good condition, but decay had attacked the dentine. No abscess had occurred, and the peridental membrane was in health. To secure permanence beyond that of a pivot tooth, he filled the pulp cavity and restored original form of tooth with gold, but for improved appearance, succeeded in covering the front surface with a nicely-adapted piece of artificial tooth, held in position by the gold which encircled it, showing a band of about one-half to a line in width.

Dr. McDonneld thinks that fracture does not result from expansion of gold, but from packing or malleting at time of filling.

Dr. C. D. Elliott likes prepared cylinders.

Dr. Tenney fills two-thirds of large cavities with oxychloride of zinc or Guillois' cement, and covers with gold.

Dr. Arthur, when inserting pivot teeth, fills the root with Hill's stopping; makes a hole in the filling, and, roughing the gold pivot, warms it and inserts. The stopping spreads out, and fills perfectly between root and artificial crown.

Dr. Elliott does not solder gold back on plate tooth for pivoting, but uses ordinary pivot tooth with gold pivot, fastening into crown and root with Guillois' cement. To fill a large cavity on labial surface of a central incisor, he ground and fitted a piece of artificial tooth, then fastened it in place with the cement.

Dr. Ansart, as regards pivot teeth, always backs with gold; attaches a square pivot, fitted to a square gold box inserted in root, and held by gold packed thoroughly around. Splitting the pivot, sawing through it lengthwise, it acts as a spring, is easily placed or removed for cleaning, and holds well.

Dr. Davis had such a case as Dr. Elliott describes, but used a piece of enamel from natural tooth, and fastened with gold. Discussion closed.

Dr. Magill, being called on for the regular essay next in order, on "Preservation of Children's Teeth," stated that he had been unable, for want of health, to do the subject justice. He proposed, informally, to open the discussion by a few remarks. The term "temporary," as applied to teeth, was really a misnomer, and unfavorably influences parents and even dentists in their consideration of the deciduous teeth. Showed cast of a set of adult teeth, in which the deciduous cuspids occupied the place and performed the office of permanent cuspids. Decay is, therefore, not necessarily inherent in deciduous teeth. Our duty toward them requires us to keep in view the possibility that they may become and be needed as permanent organs. Decay may result from defective structure, from imperfect nutrition, or from chemical action. It is of first importance to adopt preventive treatment. The deposit of dentine begins about the period of birth, and our treatment should commence about this time by furnishing proper food. As dentists are not now often consulted at this period of dentition, the advantage of establishing a chair of dentistry in each medical college might be considered as a prompt mode of reaching the case. Education of parents and children is of the utmost importance, and probably will be best reached through education of the dentist, also through school books. Dr. M. thinks that in the modern cements we have valuable aids in saving first molars, of which the pulps are dead, for young persons. Has more confidence of success than with amalgam.

Dr. BOCKIUS gains the confidence of timid children by probing sound teeth, and going through the motions of filling, causing no pain until the child has lost its fear.

Dr. GILLESPIE can succeed with children only by kindness. Their first impressions are very enduring, and they can read character acutely and intuitively. Sometimes cannot gain their confidence in any way.

Dr. MAGILL thinks it a good plan for parents to take young children in their laps and to sit in the dental chair while the dentist makes the examination.

Dr. C. D. ELLIOTT—If he thinks that he will hurt a child during an operation, always tells them so. Discussion closed.

The bill of expenses of the Corresponding Secretary, Dr. Welchens, amounting to $11.75, was presented and ordered to be paid.

The new officers were then installed.

On motion of Dr. BOCKIUS, it was ordered that the transactions of this Society at this session be published, the number of copies to be left to the discretion of the Publication Committee, and if the expenses can be covered by advertisements, that, having reserved 150 copies, the remainder be distributed gratis among the members.

Adjourned until 8 P. M.

In the evening, Dr. WELCHENS delivered a public address on the human tooth.

Then, after a few farewell remarks by the President, the Society adjourned to meet on the second Tuesday of July, 1873, at 10 A. M., in the city of Lancaster.

NEW YORK STATE DENTAL CONVENTION, HELD AT ALBANY.

The dentists of the State commenced their Fourth Annual Convention at the Capitol at ten o'clock, June 26th.

The Convention was called to order by the President, Dr. Wm. B. Hurd, and the proceedings opened with prayer by the Rev. Dr. Clark.

A motion that Drs. A. L. Northrop, L. F. Harvey and H. G. Misick be appointed a committee on credentials, was carried.

The roll was then called, twenty-five members responding.

A report from the Business Committee recommended the adoption of the following order of business:

Mr. President and Gentlemen:—For the first time since the organization of this society, the Business Committee has been notified by the regular appointed essayists of the subjects of their papers in time to report in order, viz.: "Nutrition," essay by Dr. Leon F. Harvey. "Popular Information on the Subject of Dentistry," by Dr. H. C. Barrett. "Keeping Cavities Dry," by Dr. C. E. Francis.

Time of Sessions.—Morning session to convene at nine o'clock, and adjourn at half-past one; afternoon session to convene at three o'clock, and adjourn at half-past six; evening session to convene at eight o'clock, and adjourn on motion.

The report was accepted.

The Treasurer then made the following report: Receipts during the year, $670; expenditures, $547.43; balance on hand, $122.57.

The report was referred to the Executive Committee.

The Committee on Credentials reported in favor of the following delegates being admitted to seats: W. H. Atkinson, Wm. E. Hoag, S. G. Perry, 1st district; W. B. Hurd, W. S. Elliott, 2d district; T. LeGrand Ames, Luther T. Fox, 3d district; W. W. Perkins, F. D. Nellis, 5th district; M. A. Newman, F. M. Snook, 6th district; J. E. Fine, B. F. Schuyler, 7th district; C. W. Stainton, W. C. Barrett, 8th district.

On motion, Dr. M. H. Webb, of the Pennsylvania State Dental Society, was elected an honorary member of the New York State Society.

Dr. W. B. Hurd, President of the Society, then read his annual address. After returning thanks for the honor conferred in selecting him as President, he pledged himself to discharge the duties with rigid reference to the laws the Society had made. Whatever might have seemed to have been the course in times past, he was now present as President of the Society, and not of a party or clique. The proceedings should be characterized throughout by forbearance and gentlemanly deportment, and he hoped all the members would contribute toward that end.

Twelve months had passed since they last met, and in that time familiar faces had disappeared forever. The President then alluded in feeling terms to Dr. B. F. Whitney and Dr. Varney, of New York, both of whom were deceased during the past year. He recommended that as ever, members of the Society should be punctiliously jealous of its reputation, so also should all the standing committees. They should not overreach the limits of jurisdiction, and should avoid criticisms; all should endeavor to cultivate the Golden Rule.

He suggested that some provision be made, by appropriation or otherwise, to meet the expenses of the several boards appointed. All the district societies were in a most flourishing condition, and the meetings were well attended. In conclusion, he hoped that the future of the society might be one of harmony and progress.

Dr. W. C. Barrett followed in a feeling eulogy of the late Dr. Whitney, who he said was the father of the present society, and at its conclusion moved that a committee of three be appointed to draft resolutions, which was adopted.

Drs. Barrett, George E. Hays and S. H. McCall were appointed such committee, and Drs. Carr, Marvin and Bronson were also appointed to draft resolutions to the memory of Dr. Varney. The committees were directed to report this evening.

The Board of Censors, consisting of Drs. Hurd, Kingsley, McCall, L. D. French, Harvey and F. French, reported that they held a meeting for the examination of candidates yesterday, and also this morning, and recommended that diplomas be granted to the following named gentlemen: J. Edward Steine, D. D. S., Rochester; Fred. E. Perry, Norwich; and C. W. Stainton, D. D. S., Lancaster.

The Board also reported they would hold no meetings for the examination of candidates during the session of the State Society, except by special call of its Chairman. The Board discussed the feasibility of holding a semi-annual meeting in New York. On motion, the report was received and laid on the table.

The Publication Committee, Dr. Marvin, chairman, recommended that the proceedings for the past two years, together with the papers, be collected and presented to the next Legislature for publication. The report was accepted.

The Business Committee reported the business for this afternoon, consisting of "Incidents of Office Practice," a paper on "Nutrition," to be read by Dr. Harvey, and a paper on "Keeping Cavities Dry," by Dr. Francis.

The special committee appointed to oppose the extension of the Goodyear patent, reported that as no effort had been made in Congress for that purpose, they had not thought fit to take any proceedings in the matter. After some discussion the Convention adjourned until three o'clock.

The society convened at three o'clock, P. M. Essays were read by Drs. Hovey and Francis, and the subject to which the themes referred were then discussed. The subject of the second essay was, "Keeping Cavities Dry." This paper excited considerable comment, and called forth the highest praise in honor of Dr. Barnum, the inventor and introducer of the rubber dam.

The report of the censors was called for by the president. A motion to adopt this report having been made, complaints were entered by certain parties concerning the expense by the Board. It was implied that money had been wasted or otherwise disposed of to the injury of the society's treasury. Mr. Kingsley refuted all such statements to the complete satisfaction of all parties interested. The motion was laid over until the evening session, and the meeting adjourned.

The society was again called to order at eight, P. M.

In accordance with the motion carried in the morning, Dr. Freeman presented the society with a sketch of the report of Dr. B. T. Whitney, deceased. The report was received and placed on file.

The committee ordered in reference to the Death of Dr. Varney, of New York, reported through the chairman, Dr. Carr, who presented a series of resolutions relative thereto. Received and placed in full on minutes.

Dr. Ambler submitted a few thoughts on the death of Dr. Varney in writing. The same gentleman presented a resolution recommending in substance the incorporation of the likenesses of deceased members in the bound proceedings.

Dr. Abbott proposed, by way of amendment, the incorporation of likenesses in the secretary's book, also on the memorial page. Accepted.

It was moved that the society adjourn finally to-morrow afternoon. Carried.

The report of censors called up again, moved that the report be referred to a special committee to be audited.

The committee appointed was Drs. Barry, Abbott and Cook.

Mr. Kingsley called for action on the part of the State society in cases of violation of State dental laws, such as the use of titles, &c., by improper persons.

Dr. Hill lectured on "What I know about Rubber."

The committee reported no cause for their interference.

Adjourned.

THURSDAY'S SESSION.

Dr. W. P. Hurd in the chair. Prayers offered by the Rev. John James.

An essay was read by Dr. W. C. Barrett. Subject: "Popular Information on the Subject of Dentistry."

Dr. Hurd then read his annual address.

A motion was made for the election of officers for the ensuing year.

The election resulted as follows:

President.—Dr. Marvin.

Vice President.—Dr. Barrett.

Secretary.—Dr. Barns.

Treasurer.—Dr. Howes.

Corresponding Secretary.—Dr. Freeman.

The ballot was then prepared for two censors to fill vacancies in the second and fifth districts. The following were elected:

Second District.—Dr. Cooke.

Fifth District.—To fill an unexpired term of Dr. Westcott of Syracuse, Dr. Palmer.

On balloting for permanent members, the following were elected:

First District.—Drs. Perry and Atkinson.

Second District.—Dr. Munroe.

Third District.—Dr. Austin.

Sixth District.—Dr. Snooks.

Eighth District.—Dr. Harvey.

After reading and correcting minutes, the meeting adjourned for one year.

SEVENTH DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

This Society held it fourth annual meeting at Rochester, N. Y., on the fourth day of June, 1872. The officers for the ensuing year are as follows:

President—A. G. Coleman, D. D. S.

Vice-President—J. A. Chase, D. D. S.

Secretary—J. Edward Line, D. D. S.

Treasurer—F. E. Howard, D. D. S.

The essays presented and discussed at this meeting bore the following titles: "Contour Fillings," "Fraternal Intercourse and Sociability among Dentists," "The Best Manner of Preparing Gold for Filling."

The first of these was somewhat anti-Arthur, and provoked lively discussion. The remarks of those present showed conclusively that the teachings of Prof. Arthur's late work on "Prevention of Ulcers," &c., are forcing men to the use of other methods than filling for the preservation of the several members of the dental series.

J. Edward Line, D. D. S., *Secretary.*

SOUTHERN DENTAL ASSOCIATION.

The fourth annual meeting of this body will be held in Richmond, Va., commencing on the last Tuesday in July, 1872, at 10 o'clock, A. M.

O. J. Bond, *Recording Secretary.*

AMERICAN DENTAL ASSOCIATION.

The American Dental Association will commence its twelfth annual session at Niagara Falls, Tuesday, the 6th day of August, at 10 A. M.

Selections.

BIOLOGICAL AND MICROSCOPICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES, May 6, 1872.

Mr. Joseph Zentmayer exhibited his newly-invented Erecting Prism, and, in his preliminary remarks upon the subject of apparatus hitherto employed for erecting the microscopic or telescopic image, observed that the great—almost insuperable—objection to these instruments, when composed of lenses, has been that they produce double images, or a distorted single image, and cause a lamentable loss of light. Some years since, Prof. Henry Morton called Mr. Zentmayer's attention to a statement of Sir David Brewster's, to the effect that a right-angled prism interposed between the lenses of a microscope or telescope acted as an erector in one direction, *i. e.* would rectify the image so that the right side corresponded to the right side of the object, or (if rotated 90°) so that the top of the image corresponded to the top of the object, although of course it failed to accomplish both these desiderata at the same time. On investigation, however, he (the speaker) had found that if a right-angled prism was employed, many of the rays of light were so insufficiently refracted as to be lost, and further research enabled him to determine that the proper angle for a prism of ground glass was only 27° 19′, in which case there was no "cut-off," the whole depth of the prism being, under such circumstances, available.

Mr. Zentmayer stated that although most of the telescopes used for terrestrial objects were fitted with erecting eye-pieces composed of an extra pair of lenses, it was so rare for opticians to succeed in adjusting these perfectly enough to avoid serious distortion of the image as well as great losses of light, and likewise in flatness of field and accuracy of correction, that the best terrestrial telescopes, such as those used in our own Coast Survey and abroad, were fitted with astronomical or non-erecting eye-pieces, since the inversion of the image was found to be the lesser evil.

But, however unsatisfactory is the working of lenticular erectors in the telescope, their performance in the microscope is much more objectionable, and accurate adjustment correspondingly more difficult, so that their use is practically confined to dissecting microscopes of low power. In order to elude their disadvantages, Amici, many years since, contrived an erector composed of two right-angled prisms, as suggested by Brewster; but the arrangement has not proved efficient in practice. The erecting prism of Nachet is so adjusted that rays proceeding vertically from the object under examination are reflected along a tube at right angles to the body of the microscope, and reach the eye of the observer in a horizontal direction. It is inconvenient for use in dissection, because the hands when at work, are not in the direction of the axis of the eye, and also because the microscopist must keep his eye so closely applied to the eye-glass of the eye-piece.

Mr. Zentmayer's new prism, which he exhibited in successful and eminently satisfactory operation at the meeting, has the great advantage over Amici's combination, that singly it erects both in the vertical and lateral directions, without material injury to definition or serious loss of light. When in use, it is placed in the body of the microscope, immediately above the objective, and is stated to be equally applicable to each tube of the binocular instrument.

FIG. 1.

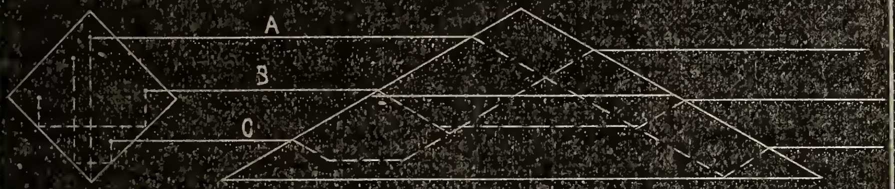


FIG. 2.

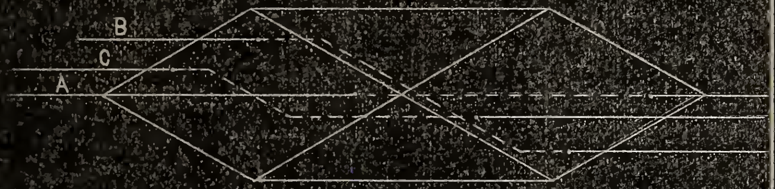
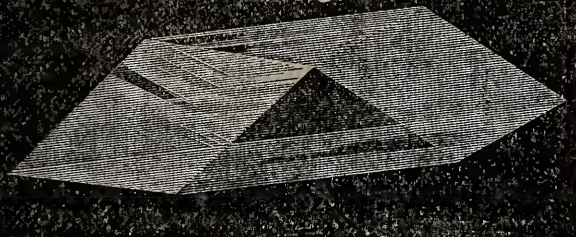


Fig. 1 shows a front and also a profile view of the prism, the projection of the former being a square, and that of the latter an isosceles triangle. The angles at the extremities of the base of this triangle are, as already mentioned, 27° 19′ for crown glass of a refracting index of 1.53.

Fig. 2 is a bird's-eye view of the prism, in which the courses of the same identical rays marked A, B and C, respectively, are represented by dotted lines.

FIG. 3.



Careful examination of these figures will show how rays such as B, entering the right side of the prism's inferior surface (as adjusted in the microscope-tube,) are reflected and refracted so as to emerge upon the left side of its superior surface; and in like manner that rays such as A, which enter near its anterior angle, are so bent as to make their exit in the neighborhood of the upper and posterior angle, thus accomplishing both the vertical and horizontal erection of the image before it reaches the observer's eye.

Fig. 3 is a drawing of the prism in perspective.

GUN COTTON AND ITS PREPARATION.

BY CHARLES H. MITCHELL.

(From an Inaugural Essay by the Author.)

A number of experiments were tried, with a view of ascertaining the relative proportions of cotton and acids, together with the proper time for maceration necessary to produce a cotton which should combine the largest yield with the highest explosive power and solubility. The following formula was at length adopted:

Raw cotton	2 parts.
Carbonate potassa,	1 "
Distilled water,	100 "

Boil for several hours, adding water to keep up the measure; then wash until free from any alkali, and dry. Then take of:

Purified cotton,	7 oz. av.
Nitrous acid,* s. g. 1.42,	4 pts.
Sulphuric acid, " 1.84,	4 "

Mix the acids in a stone jar capable of holding 2 gals., and when cooled to about 80° Fahr., immerse the cotton in small portions at a time; cover the jar and allow it to stand four days in a moderately cool place, (temp., 50° to 70° Fahr.) Then wash the cotton in small portions, in hot water, to remove the principal part of the acid; pack in a conical glass percolator, and pour on distilled water until the washings are not affected by sol. chloride barium; drain and dry. Yield, 11 oz. av.

This cotton is perfectly white, of a harsh, gritty fibre, very explosive, leaving scarcely any ash, soluble in ether, ether fortior, acetic ether, glacial acetic acid, and in mixture of alcohol and ether, varying from one part ether to three parts alcohol to pure ether itself. If a cotton superior to this is desired, it may be obtained by treating this cotton with an additional porportion of the mixed acids, washing and drying as before. The cotton gains about one per cent. in weight, becomes perfectly soluble, and is so free from any ash as to scarcely scorch a sheet of white paper it may be burnt on. Both this and the previous gun cotton may be ignited on gunpowder without exploding it. The advantages claimed for this cotton over that of the U. S. P. are, that it is perfectly soluble, very explosive, cheap, its manufacture is much more easy, requiring but little time and attention, and turning out a superior product with large yield and less cost.

The subject of collodion next claims our attention, it being the most important pharmaceutical preparation of gun cotton. The applicability of gun cotton in ethereal solution to the dressing of wounds, inflamed surfaces, &c., was first made known by Dr. Horace Maynard, of Boston. Its valuable properties soon commanded attention, and at once supplied a want long felt in the medical profession. No better formula for collodion can be found than that of the U. S. P. Using the cotton prepared as before mentioned, it left nothing to be desired.

Collodion can also be made the vehicle for other medicines. Those remedies which are used externally, of course, can only be administered in this manner. Having made a number of experiments on this subject, I present the following formulæ, several of which I think are new:

STYPTICS.

Styptic Collodion.

℞.—Tannin,	℥ij.
Stronger alcohol,	f ℥iv.
" ether,	f ℥xii.
Soluble cotton,	ʒi ℈ij.
Canada balsam,	ʒj.

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* Nitric, saturated with nitrous acid.—*Ed. Amer. Jour. Pharm.*

Introduce the cotton into a suitable bottle, pour on it two fluid-ounces of alcohol, shake well; then add ten fluid-ounces of the ether, and agitate frequently until dissolved. Dissolve the tannic acid in a mixture of the remainder of the alcohol and ether, mix with the first liquid, add the balsam, allow it to stand until clear, then pour off.

Collodion with Sesquichloride of Iron.

℞.—Sesquichloride of iron,	ʒj grs. iv.
Stronger alcohol,	f ℥iv.
" ether,	f ℥xij.
Soluble cotton,	ʒj grs. iv.

Into a suitable bottle introduce the cotton, pour on two fluid-ounces of the alcohol, and shake well; then add the ether, and agitate frequently until dissolved. Dissolve the sesquichloride of iron in the balance of the alcohol; mix with the prepared collodion.

ANODYNES.

Collodion with Aconite.

℞.—Pulv. aconite root	℥ij.
Ether,	f ℥vj.
Soluble cotton,	ʒj grs. iv.
Stronger alcohol,	q. s.

Mix the ether with two fluid-ounces of alcohol, moisten the aconite with one fluid-ounce of this, pack in a percolator and percolate with the balance, pouring on *q. s.* alcohol to recover eight fluid-ounces, in which dissolve the cotton.

Collodion with Belladonna.

℞.—Powdered belladonna root,	℥ij.
Ether,	f ℥vj.
Alcohol	q. s.
Gun cotton,	ʒj grs. iv.

Mix the ether with two fluid-ounces of alcohol, moisten the belladonna with one fluid-ounce of this, pack in a percolator and percolate with the balance, pouring on *q. s.* alcohol to recover eight fluid-ounces, in which dissolve the cotton.

ANTISEPTICS AND DISINFECTANTS.

Collodion with Carbolic Acid.

℞.—Carbolic acid,	ʒj.
Ether,	f ℥vj.
Stronger alcohol	f ℥ij.
Cun cotton,	ʒj grs. iv.

Dissolve the gun cotton in the ether and alcohol mixed, and then add the carbolic acid.

Collodion with Sulphocarbolate of Zinc.

℞.—Sulphocarbolate of zinc,	ʒj.
Ether,	f ℥vj.
Stronger alcohol,	f ℥ij.
Gun cotton,	ʒj grs. iv.

Introduce the cotton into a suitable bottle, add one fluid-ounce alcohol, shake well; add the ether, and agitate frequently until dissolved. Dissolve the zinc salt in the balance of the alcohol, and mix with the prepared collodion.

Collodion with Thymol.

℞.—Thymol,	ʒj.
Ether,	f ℥vi.
Stronger alcohol,	f ℥ij.
Gun cotton,	ʒj grs. iv.

Dissolve the cotton in a mixture of ether with part of the alcohol, dissolve the thymol in the balance of the alcohol, and mix.

STIMULANTS IN CUTANEOUS DISEASES.

Collodion with Iodide of Mercury.

℞.—Mercuric iodide,	ʒi.
Potassium iodide,	ʒss.
Alcohol.	f℥iv.
Ether,	f℥iv.
Gun cotton,	ʒj grs. iv.

Triturate the iodides together in a mortar, add the alcohol boiling, and rub until they are completely dissolved. Then add the gun cotton, lastly the ether, and agitate frequently until the cotton is all dissolved.

STIMULANTS AND RUBEFACIENTS.

Collodion with Arnica.

℞.—Pulv. arnica,	℥iv.
Ether,	f℥xij.
Stronger alcohol,	q. s.
Gun cotton,	ʒij grs. viij.

Mix the ether with four fluid-ounces alcohol Moisten the arnica with *q. s.* of this, pack in a percolator and pour on the balance, following with alcohol until sixteen fluid-ounces of tincture have been recovered; to this add the cotton, and agitate frequently until dissolved.

Collodion with Capsicum.

℞.—Grd. capsicum,	℥iv.
Ether,	f℥xij.
Stronger alcohol,	q. s.
Gun cotton,	100 grs.

Proceed as in collodion with arnica, recovering sixteen fluid-ounces of tincture, in which dissolve the gun cotton.

Collodion with Mezereon.

℞.—Grd. mezereon,	℥iv.
Ether,	f℥xij.
Alcohol,	q. s.
Gun cotton,	128 grs.

Mix the ether with four fluid-ounces of strong alcohol, and in this allow the mezereon to macerate one week. Drain, pack tightly in a conical percolator, pour on the separated liquid, and follow with enough alcohol to recover sixteen fluid-ounces of tincture, in which dissolve the cotton.

Collodion with Savin.

℞.—Powd. savin leaves,	℥iv.
Ether,	f℥xij.
Alcohol,	q. s.
Gun cotton,	128 grs.

Proceed in same manner as collodion with capsicum.

Collodion with Black Pepper.

℞.—Grd. black pepper,	℥iv.
Ether,	f℥xij.
Alcohol,	q. s.
Gun cotton,	128 grs.

Proceed in same manner as in collodion with capsicum.

VESICANTS.

Collodion with Cantharides.

℞.—Powd. cantharides,	℥iv.
Ether,	f℥xij.
Stronger alcohol,	q. s.
Gun cotton,	80 grs.

Moisten the cantharides with a small portion of the ether, and pack in a conical percolator. Then pour on the balance of the ether, mixed with four fluid-ounces alcohol, and follow with enough alcohol to recover sixteen fluid-ounces, in which dissolve the gun cotton.

These collodions can be used as substitutes for many of the officinal plasters, having the advantage of occupying a small bulk, ready adaptability to any surface, and powerful therapeutic action.

I have endeavored, as far as possible, to give some practical information on a branch of pharmacy of which comparatively little is known. The subject is, I think, an important one, since gun cotton and collodion occupy a high position in both medicine and the useful arts, and to its elaboration and useful application too much study cannot be devoted.—*Am. Jour. Phar.*

THE NEW DISINFECTANT—CHLORALUM.

There is no question but that in the hydrated chloride of aluminium, or *chloralum,* we possess a very valuable antiseptic, deodorizer and disinfectant; its properties being due to the hydrochloric acid with which the base is combined; it is, therefore, amongst disinfectants allied to chloride of zinc and chloride of lime, but differs materially in some respects from either of these.

Its special recommendations are that, owing to the harmlessness of aluminium —it is non-poisonous—that it is non-odorous and remarkably cheap. Unquestionably, the mal odor of commercial carbolic acid is in a great many cases fatal to its use, while the poisonous properties of that powerful acid, as well as of chloride of zinc, render their employment a frequent cause of accidents, often of a fatal character. The absence of danger, then, in the case of chloralum is in itself a very great recommendation, and one which must bring peculiar satisfaction to the originator, since he will thus be the means of saving many valuable lives.

The purposes to which chloralum may be applied are very numerous.

To prevent the decomposition and correct the fœtor of most animal discharges, either natural or the products of disease, as the fæces and urine, the discharges from wounds, ulcers, of cancer, &c.

To obviate the decomposition and destroy the smell of foul waters, including sewage.

To remove or destroy several odors of a special character; such as those arising from stables, from certain animals of the carnivorous and feline class— the fox, cat, polecat, &c., or from some vegetables, as garlic and onion.

Medicinally, it may be employed either internally or externally, as a gargle, wash or lotion, as in diphtheria, to the skin in scarlet fever and small-pox, and as a styptic to bleeding surfaces.

Lastly, certain simple precautions being observed, it may be used for the disinfection of clothes with great advantage, and in the scrubbing of boards, to remove impurity on the floors of sick rooms and wards, the decks of ships, &c.

Owing to its non-volatile character, as an aerial disinfectant chloralum is probably inferior to some of the less stable compounds.—*Food, Water and Air,* November, 1871.

COMBINED ACTION OF CHLOROFORM AND MORPHIA.

The attention of the profession has lately been called, more particularly than hitherto, to the influence of morphia in facilitating and prolonging the anesthetic influence of chloroform. Experiments instituted by Claude Bernard and other European scientists, appear to have demonstrated that the combined action is not only more prolonged, but also safer than that of chloroform alone. One-third of a grain of morphia is injected into the skin fifteen or twenty minutes before the inhalation. The inhalation is followed by a brief period of excitement, after which comes complete anesthesia, which is very easily kept up by small quantities of chloroform. In an operation, which lasted one hour and three-quarters, the patient was kept completely insensible for that length of time by an ounce and a half of chloroform. The risk of death is regarded as much diminished by this plan of treatment.—*Pacific Med. and Surg. Jour.*

THE DENTES SAPIENTIÆ.

BY J. P. WILSON, D. D. S., BURLINGTON, IOWA.

Many persons have very erroneous ideas with reference to these teeth. It is not uncommon for dentists to say to their patients, "the wisdom teeth are of no account; it will not pay you to have them filled." Physicians almost universally pronounce them worthless. This impression is very general, both with the medical and dental professions, and in this way the public has been educated to believe that they are of no value. I wish to offer a few thoughts on this subject.

That these teeth are naturally of poorer material than others, I do not believe. But every observer must admit that they are liable to decay soon after they are erupted. It must be admitted also, that *all* the teeth are more in danger of decay at the time and soon after their eruption, than they are in subsequent years.

A wisdom tooth that has just emerged from the gums is in an immature state. The lime salts are not thoroughly hardened. We will find on an examination, that where the enamel folds together on the grinding surface of these teeth, there is frequently a fissure sufficiently open to receive the point of a small excavator. On cutting away these folds of enamel, it will be found that the dentine is quite soft—not decayed—and in this immature state they *are* more liable to caries. But let it be remembered that the first and second molars at the time of their eruption, are, also, more in danger of caries than they are at the time of the eruption of the third molars. In other words, the first and second molars are fully developed and matured, at the time the third molars are erupted—the former have passed the most critical period, the latter have not.

The wisdom teeth decay more frequently on their buccal surfaces than the other molars. This is, doubtless, owing to their unfortunate location. In many mouths it is quite difficult to remove particles of food from that side of the teeth. We frequently find collections of decomposed food in this location, even in the mouths of persons who use the brush regularly. This condition, of course, soon brings about disintegration of the enamel, and the destruction of the tooth soon follows.

If a young person has lost the first or second molar before the third molar is due, we should await the appearance of the latter with considerable interest, and on its arrival, use the utmost care to preserve it until it is fully matured, and after that it will be no more liable to decay than any other molars. The space that has been formed by the extraction of the first or second molar, will be almost, if not entirely closed, by the wisdom tooth inclining forward, and resting finally almost in the place formerly occupied by the second molar.

In some instances the maxilla is not sufficiently developed to receive the entire set of permanent teeth. In such cases the third molars are a source of great annoyance, sometimes irritating the surrounding parts to such an extent, as to cause extended inflammation, and sometimes a free discharge of pus follows. In *such* cases I should recommend the extraction of the offending member.

The points, then, I wish to make, are these: not to extract wisdom teeth, *because* they are such, nor to neglect filling them on the mistaken idea that they are naturally worthless, but to extract them *only* when their absence is more desirable than their presence.—*Missouri Dental Journal, June*, 1872.

MICROSCOPIC EXAMINATION OF TISSUES.

At the present time it will be interesting to many of our readers to notice the tenor of a communication to the Biological and Microscopical Section of the Academy of Natural Sciences of Philadelphia, upon "The Preparation and Preservation of Tissues," by Dr. J. Gibbons Hunt, who has of late quite discarded the use of glycerine, and the terebinthinate media, for mounting such objects, in favor of watery solutions of low specific gravity. As evidencing the superiority of aqueous fluids, he exhibited to the society a specimen of Aspergillus which he maintained could only be seen as thus prepared; no gradual condensation of a heavier liquid, such as glycerine or balsam, being sufficient to answer the purpose. Dr Hunt stated that any extremely delicate cell walls are most clearly visible when mapped out by carmine or aniline solution, and this staining, if done with care, may be accomplished without any other alteration of the tissue whatsoever. The green portion of plants cannot be satisfactorily preserved in alcoholic liquids, because spirit of wine dissolves chlorophyll, but the verdant hue may be admirably imitated by staining with a solution of indigo aniline, to which a few drops of tincture of picric acid have been added. The speaker here exhibited a specimen of Sphagnum from Washington, mounted in balsam, which he said showed almost nothing, whilst a similar preparation mounted in a watery solution displayed every detail of its structure. In regard to animal tissues, Dr. Hunt observed that epithelial cells and sections of mucous membrane can hardly be seen at all when mounted in balsam, but when preserved in an aqueous fluid of low specific gravity, show to great advantage; and mentioned further, in reference to staining animal structure, that he had found that a neutral solution of carmine, prepared according to the formula of Rollett, enabled us to display in muscle for example, not only nuclei, but also well-defined cell walls.—*The Doctor*, *July*, 1872.

SUBSTITUTION OF CARBOLIC OR PHENIC ACID FOR CREASOTE.

BY MR. T. N. R. MORSON.

The value of the wood creasote of Reichenbach as a remedial agent, and its employment in the preservation of articles used as food, has been fully proven during the forty years we have been manufacturers of this article.

Of late years its reputation has suffered from the substitution of carbolic or phenic acid for true creasote; and as no good test to distinguish these bodies has been published, (and those of our Pharmacopœia are for this purpose useless,) we shall feel obliged by your publishing a very simple means for distinguishing these two bodies, which my son, Mr. Thos. Morson, has discovered in making some experiments on adulterated samples submitted to us. The test is glycerin, in which true creasote is *insoluble, or nearly so.* Carbolic or phenic acid, on the contrary, *dissolves in all proportions*, and any large amount of this latter substance, if mixed with true creasote, will render the creasote soluble.

The danger of substituting carbolic or phenic acid for creasote, to be used internally for food, is well known.

To test a suspected sample, mix it with an equal quantity of pure glycerin. If they unite and make a clear solution, the substance is carbolic acid, or in greater part consists of it.—*Pharm. Jour.*, *Lond.*, *May* 18, 1872.—*Am. Jour. Phar.*, *July*, 1872.

ETHER GLUE.

An excellent liquid glue is made by dissolving glue in nitric ether. The ether will only dissolve a certain amount of glue, consequently the solution cannot be made too thick. The glue thus made is about the consistency of molasses, and is doubly as tenacious as that made with hot water. If a few bits of India rubber, cut into scraps the size of buckshot, be added, and the solution be allowed to stand a few days, being stirred frequently, it will be all the better, and will resist the dampness twice as well as glue made with water.—*Scientific American*, *April* 20, 1872.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY,

S. E. corner Arch & Tenth Sts., Philadelphia.

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PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Sixteenth Annual Session, 1872-'73.

Preliminary Lectures and Instructions.—The Dispensary and Laboratory of the College will be opened on the 1st of September, when ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability. During October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday of November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical pecularities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

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PHYSIOLOGY AND MICROSCOPIC ANATOMY.

The lectures from this chair will include human physiology, histology and physiological chemistry, with such portions of comparative physiology as are essential to a comprehensive understanding of the subject. The doctrines of life and organization will be appropriately considered. The course will be amply illustrated by appropriate diagrams, chemico-physiological experiments and vivisections, as well as by microscopical demonstrations.

ANATOMY AND SURGERY.

The instruction in this department will embrace a systematic course of Lectures on Descriptive and Surgical Anatomy, fully illustrated by dissections on the *cadaver*, preparations, models, drawings, &c.

The minute anatomy of the various organs and tissues of the body will be shown by the class microscope, and particular attention will be given to the demonstration of the anatomy of the head and face.

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THE

DENTAL TIMES.

Vol. X. PHILADELPHIA, OCTOBER, 1872. No. 2.

Original Communications.

THE MANIPULATION OF GOLD-FOIL IN FILLING TEETH.*

[Read before the Alumni Association of the Pennsylvania College of Dental Surgery.]

BY W. H. TRUEMAN, D.D.S.

In introducing this subject to your notice, gentlemen, I do not desire to indulge in any elaborate prefatory or historic remarks, but, in as few words as possible, consider the relative *practical* advantages and disadvantages of the various methods of using gold-foil for the preservation of decayed teeth.

I do not propose to consider this subject exhaustively—that has been done elsewhere. On the present occasion I desire simply to notice some more important points, with the special object of contrasting the adhesive, or rather the *cohesive* and non-cohesive methods of using foil. Here allow me to state that it is perfectly reasonable and proper for a dentist to consider that method *the best* which he has found most satisfactory in daily practice, and in a discussion like this, to place the advantages of his and the faults of other methods in the strongest possible light; but it would be unjust to presume that by so doing he necessarily *condemns* the practice of others. The success or failure of any method depends in a great measure upon the peculiar manipulative skill brought to bear upon it; some acquire expertness in one direction, some in another.

A strong man may urge a boat forward against the tide, but would waste his strength foolishly if he exerted himself equally in rowing with it. By the expenditure of a great deal of time and labor a good filling can be made with adhesive pellets, but that extra time and labor is wasted if the same object can be accomplished as well by other and more feasible means.

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* The discussion on this paper will be found under the head of "Dental Associations."—Ed.

Absolute dryness and cleanliness (chemical cleanliness) is essential to perfect success in using gold cohesively. This is frequently not only difficult to secure and maintain even with our most approved appliances, but it is also equally difficult to *know to a certainty* whether we have them or not at every stage of the operation. Their absence in a slight degree, if not fatal, injures to a greater or less extent the security of the operation. It is these considerations which have led me to be exceedingly distrustful of any method of using gold that depends entirely upon its welding properties—not because I doubt the possibility of welding the foil into a solid and homogeneous mass; this has and can be done out of the mouth, and, perhaps, in some cases, in it. But the mechanical difficulties encountered, the time and labor required, and the uncertainty always attending it, in the total absence of any compensating advantage, render it far inferior to older and more reliable methods.

I am aware this expression is in direct conflict with the theory and practice of a vast majority of my professional brethren. I can only say it is the result of a long and careful examination of the subject, began some years before I became a student in this institution; and with all due respect and deference to the opinions of others, the more closely I examine into it, the more enlarged my experience and observation becomes, the more thoroughly I am convinced that the method of using gold adhesively, depending entirely upon its welding together, however well it may appear in theory, is deficient in practice; and that wedging, not welding, is most to be relied upon. With this brief introduction, I invite your attention to the subject selected, beginning with the preparation of the cavity.

As these remarks are addressed to men of experience, I do not propose to enter very deeply into this branch of the subject; but presuming you are perfectly familiar with the arrangements usually adopted in using adhesive pellets, will simply suggest the more prominent points of a cavity prepared for the wedging process.

Much, of course, depends upon the shape of the cavity, and this, in turn, upon its position and the destructive forces it is expected to resist. In the first place, it must be readily accessible, not only to our instruments and sight, but also to the gold we intend to place in it. It is very desirable, if not absolutely essential, that the gold should be condensed in the cavity, and in the exact spot it is intended to occupy, to insure a solid and reliable operation.

In approximal cavities, where we simply desire to exclude destructive agents and support the weakened structure, where there is but little if any pressure exerted upon the surface of the filling, a slight enlargement at two or more readily accessible points is all that is required. In the incisors these are generally most conveniently formed by making the lower part of the cavity a little deeper inside than out, and forming the extreme upper point in like manner; while in bicuspids and molars it is often more convenient to obtain this hold at the sides. In the incisors, and in fact in all approximal cavities, too much care cannot be exercised in properly shaping the lower part of the cavity; for it is here we mostly lay our foundation—and accuracy at this point is absolutely demanded. It should be cut in as deeply as convenient, so as to form a solid base on which to condense our first portion of gold, and great care used to avoid all sharp corners and angles.

An excellent idea as to the general shape of these cavities, and also of the best mode of filling them, may be obtained by observing the arrangement by which mechanics handle large blocks of stone in building. In the face of the block intended to be uppermost, they sink an oblong cavity, a few inches deep, and considerably wider at the bottom than top. Into this are placed two triangular pieces of iron—one on either side—leaving an opening, with parallel sides, in the centre; into this an iron rod is inserted, and the three firmly bolted together at the top. This simple arrangement passing into the stone a few inches, and fitting quite loosely, will support an immense weight, and rarely gives way.

In crown fillings, which are subjected to great pressure in mastication, we simply reverse matters, and prepare a cavity with parallel sides, or slightly larger at the top than the bottom, so that if there should be any settling of the gold—that is, if it should become any more condensed, instead of rendering the edges imperfect, it will only become more solid and accurate. Any giving way in a really solid filling *theoretically* is a contingency not to be looked for; and yet experience teaches this shrinkage often occurs, even in fillings thoroughly impacted, pellet by pellet, with mallet or hammer. No method of working gold gives *perfect* security against it. Unnoticed it may be, it still exists, and is very often the first cause of little pieces scaling out around the edges of adhesive fillings, so frequently complained of, and ascribed to imperfect welding. We must remember, perfection belongs only to nature. Behold this little instrument—a needle—a miracle of human ingenuity and skill; its sharp point, its perfect smoothness and regular form. Examine this with the microscope, and how rude and uncouth it appears. Could we as closely examine any of the many boasted operations pronounced so perfectly solid and compact, so thoroughly condensed and hard as to preclude the possibility of being injured, those marvels of pounding, punching, hammering, we so often hear of, there is but little doubt we would have another convincing proof of human weakness. I doubt, indeed, the bare possibility of making gold so solid, so hard or thoroughly condensed as not to be affected by the immense force of mastication constantly and continually brought to bear upon it. Especially as we find the natural covering of the teeth—the hard, unyielding enamel—frequently fails to withstand it. What is the inevitable result if a filling is left so full as to strike an opposing tooth, and periostitis fails to call our attention to it?

Admitting this, we see at once the wisdom of giving these cavities this peculiar shape whenever possible; how easy we may have imperfect edges and decay setting in around crown fillings, however hard and solid they may be if this is neglected; and a very little close examination will show how prone the gold is to disintegrate and break away where any other form but cylinders or their equivalents are used. You will observe, that if a filling like this is started from its place ever so slightly, the first effect is to break up the attachment of the last layer of pellets. A study of this force and resistance, thus brought in conflict, leads us to expect this to begin at the edges, especially if they are slightly beveled outward, as our text-books very properly recommend—precisely the effect too often seen in actual practice.

Thus we see the stability of a filling depends upon its solidity and the firmness with which its integral particles are held together; not hardness, as some have thoughtlessly asserted; thoughtlessly, I say, for in the present rage for hard fillings the distinction between hardness and solidity, although so wide and well marked, is seldom referred to. We cannot have solidity without a certain degree of hardness, while it is possible to have a great degree of hardness in a filling with but little solidity. In illustration of this distinction, this strip of commercially pure gold has been carefully worked by forging and rolling so as to develop its greatest hardness. One end you observe is quite hard and elastic, while the other, which has been annealed, is soft and pliant. The difference in density between the two ends, according to our text-books, is exceedingly slight, so slight we may assume them to be equally solid and compact.

Hardness, although not essential, is desirable, provided it can be obtained without sacrificing other and more important requisites. Hardness in gold is accompanied by rigidity and harshness, and is developed at the expense of cohesiveness and pliancy.

We require for successful filling: first, solidity; second, close adaptation, and third, stability among the various laminæ of the gold itself. Let us examine how far we can practically obtain these conditions by the two systems of *wedging* and *welding*, into which the various methods of using gold are readily divisible.

I do not propose to describe the process of filling teeth by either method, but simply call attention to the more prominent advantages and disadvantages of each, laying more stress, perhaps, upon the weak points of adhesive fillings—not from prejudice, but because they are less frequently referred to.

In the preparation of gold for welding, the usual practice is to first form it into a loosely-rolled rope, and to divide this with the scissors into smaller portions, called pellets. Let us examine for a few moments the minute structure of one of these little pellets. Before it has reached its present form the gold composing it has been subjected to more or less manipulation. No matter how carefully it has been handled in the rolling and twisting process, the gold, to a greater or less extent, loses its softness and pliancy; or, in other words, becomes hard, and can only be fully restored to its former condition by a process of annealing, as carefully conducted as that it received when it left the beater's pack.

I have here half a sheet of number five, adhesive foil, which has not been annealed. You observe it possesses quite a degree of stiffness and rigidity. Here we have another precisely like it, from the same beating, and, perhaps, the same pack, which has been annealed. We will form both of these into a tape by repeated folding. In this manipulation, the cohesiveness of the gold, no doubt, is considerably impaired by the perspiration from my fingers, but we perceive it still retains its softness and pliancy although folded many times. It readily yields to pressure, and has no tendency to spring back when the force is removed. Not so with the unannealed; it is hard and elastic; and if we attempt to work it into a cavity would cut and break rather than pack. We will take the remaining portion of the adhesive gold, and form it into a rope, which, you observe, approaches very nearly the condition of the tape of unannealed foil. It is stiff and rigid, owing somewhat to its cylindrical shape; but it is also elastic and hard; this is due entirely to the change which has taken place in the gold itself. We will carefully flatten this out by rolling over it this instrument, so as to avoid all friction, and compress as lightly as possible. You observe its rigidity, stiffness and elasticity are considerably increased. And this is the condition this pellet or rope is in before the real welding process begins. These laminæ must be brought in contact; and the method we have adopted to do it is far less severe than the action of the plugger. The more we manipulate and bend and punch and twist, the more we change the form and produce motion among the particles of this gold, the more we increase this elasticity and hardness; the harder it gets the more rapidly does it become hard, and in exact proportion loses its property of cohesion. This is noticed by all workers in adhesive gold; and I believe it is the custom with many to anneal their pellets immediately before using. This restores, or rather increases its cohesiveness, and brings it into a condition decidedly sticky, but does not restore it to its original condition It has lost its softness and pliancy, the mellow, kid-like feel it had, and has become hard and harsh. It rapidly hardens under pressure, and requires careful and discreet management to thoroughly pack it in position.

Let us again examine this pellet or rope; observe its various laminæ in the relation they hold to each other, and you will find an entire absence of order and arrangement. Before they can be brought into close enough contact for welding there must be a great deal of friction and rubbing of surfaces, all of which tend to make it hard and unyielding, and destroy its cohesiveness. By the time it is packed in position, and ready for final condensation, it is full of seams and creases, which must be literally *forged out* before it becomes a solid mass, if it ever does. Various methods have been proposed from time to time to avoid these difficulties, by using gold in tapes or blocks, &c., and the more recent revival of heavy foil; but the only plausible method to my mind is the original suggestion of Dr. Arthur, condensing the gold a single lamina at a time. All others introduce difficulties equally or more serious than those they are intended to avoid.

The mallet, it is true, especially some of the more recent forms—automatic, rotary, or electric, assists us very much in overcoming this difficulty. Whether the excessive force employed will prove destructive, or not, remains to be proved. Excessive malleting with the hand instrument, no matter of what material it is made, very seriously injures teeth subjected to it. There is reason to suppose the sharp, quick blows of the new instruments, repeated with great rapidity, may produce better work with less risk, especially if they can be used with safety close to the walls of the cavity. There still exists a serious objection in the necessity of using nearly straight instruments, requiring a considerable sacrifice of tooth structure to gain access to many cavities, and bringing fillings in sight, which, with suitable instruments, could be filled from the inside without being seen. And here we ask the question, Where is the practical advantage? The saving of time is slight; it requires nearly the same labor; what greater result than the useful salvation of the tooth rewards this complication? A result more easily and rapidly attained, and with equal if not more certainty by the simple non-cohesive methods.

I do not wish to be understood as condemning this method of using gold. In many cases it can be used with decided success, and that it has enabled us to perform some operations before unthought of, we freely admit, but cannot give to it the unbounded praise so often accorded.

There are various methods of preparing gold for the wedging process, all of which we presume are perfectly familiar to you. For the purpose of illustration we will take the cylinder, simply as a type; other methods, no doubt, are equally good, but with this we are more familiar, and, claiming no originality, will confine our remarks principally to the plan we usually adopt—cylinders, in conjunction with pellets.

The first step in forming a cylinder is to fold the gold into a tape; this can be done neatly and rapidly by the fingers. Some prefer folding it with a knife or paper cutter on a cushion, but the friction of the instrument is apt to harden the gold. A little practice is all that is required. By carefully turning down one end of the tape a few times with the tweezers, so as to make a beginning, the tape is rapidly formed into a cylinder with the finger, using the tweezers to keep the ends smooth and even. Rolling the tape on a broach or any instrument is decidedly objectionable; it is apt to roll them too hard for rapid and accurate adaptation, and leaves a hole in the centre very hard to close up.

By this means the various laminæ of gold are brought into the best possible position, and except the little moisture it may have acquired in handling, the best condition for subsequent weldings. A very slight force, very slight indeed in comparison with the mass of gold, is sufficient to bring every one of its various laminæ to forcible, if not actual contact.

The consistency or hardness of the cylinder depends very much on the position we intend it for. As a rule they should be soft enough to be readily compressed with the fingers. Often we require them in the form of a block or mat, in fact it is impossible to give any special instruction as to these, or the best mode of introducing or placing them in position. These are matters which depend entirely upon the operator's judgment. The cylinder should be introduced with as little compression as possible, and after placing it in the position it is intended to occupy, thoroughly condense with firm and steady pressure, directing the force against the wall and bottom of the cavity. Care is required not to disturb it during this operation, especially if adhesive gold is used. Sometimes a second instrument is required to hold it in place until supported by its fellows. It is usually desirable to have cylinders against the principal walls of the cavity, leaving an opening in the centre to be filled with pellets. In filling this we find a decided tendency to clog; this may be avoided in a measure by forcing the first pellets well home, and constantly plying a thin-bladed instrument between the pellets and the cylinders, securing at the same time solidity at the bottom of the filling as well as the top.

The pellets may be twisted much tighter than when used adhesively, as it is really a matter of little moment whether they unite or not, as the final condensation, crushing down the tops of the cylinders, firmly rivets them in position, while they in turn hold the cylinders in place with equal force. I have no doubt, as a rule, considerable adhesion takes place in a filling of this kind, especially if adhesive gold is used; but we place no dependence whatever upon it. A cylinder filling will be held firmly and securely in position if there is not a single lamina of gold united to its fellow.

I know many object to this wedging, supposing there is a constant strain upon the walls of the cavity. Admit there is, I cannot see what harm it could do—it would certainly assist very much in securing perfect adaptation.

If gold was a compressible body like cork, or a sponge, this would be the case—but we find it is not. The cylinders are compressed by the laminæ being brought into close contact, but there is no compression of the gold itself. If we drive a wedge between the laminæ of a filling partially condensed, when removed it leaves an opening as large as itself, and this occurs as long as it is possible to effect an entrance. If there was any elastic force present, this should close up when the instrument is withdrawing, an effect I have never observed.

Another objection is the supposed difficulty of making a cylinder containing from half to two or three sheets of No. 5 foil, as I have sometimes used in large cavities, adapt itself closely to the little inequalities of the cavity. In this I have had no difficulty, yet prefer to use several moderate sized cylinders rather than have them excessively large. We should of course make our cavities as smooth and plain as possible, avoiding carefully all sharp angles and inaccessible nooks and corners; and adapt the shape, size and hardness of the cylinder to the peculiarities of the cavity. We must remember when a cylinder containing a great many folds of gold is subjected to pressure there is very little force lost, it is transmitted from lamina to lamina, and distributed through the entire mass; and also the gold acts as a cushion to force that next the wall into all the minute roughnesses with very great accuracy. In illustration, take a file, and lay on it one thickness of No. 5 foil, and attempt to press this into the depression with a large condenser, and you will find it impossible. The condenser bears about the same relative proportions to the file cuts a fine plugging point does to the minute roughness on the walls of a cavity. Now try the experiment with fifteen or twenty folds, and it will take an accurate and sharp impression, and in like manner I have no doubt cylinders can be brought into closer and more complete contact with the walls of the cavity, filling up more perfectly its little roughnesses, than it is possible with pellets even in the most skillful hands.

Another suggests if at any time the tooth breaks, the filling will surely come out, while those put in adhesively and secured by retaining points often remain. This I freely admit, but cannot see the force of the objection. If so large a portion of a tooth breaks away as to release a cylinder filling, the same violence nine times out of ten would displace or injure any operation so as to require renewal. Teeth filled in this manner are not so liable to accident as those filled with mallets and pellets—first, because the gold is bolstered more firmly against the walls of the cavity, and second, the teeth are not weakened by repeated blows of the instrument. We must remember the enamel, and in a less degree the dentine also, have but little elasticity; they are hard and brittle, a hard quick blow is far more destructive to a structure of this kind, than a firm and steady pressure.

Again, I have observed adhesive fillings, although well supplied with retaining points and hammered and pounded, do not always wait for an accident to occur. With them a motion to adjourn seems always in order; and with but little regard to order or propriety, they quietly move off in detachments or solid phalanx, leaving the retaining points and the gold they contain to take care of themselves.

Attention has been called to cylinder fillings, or perhaps it would be more comprehensive to say wedged fillings, for it applies equally to the old fashioned barley-corn pellets and also tapes, pushing out beyond the cavity after they have been in some time. It has been suggested, this is due to the moisture or fluids of the mouth entering between the laminæ of gold by capillary attraction, and causing an increase of bulk. An extended observation has shown this to occur almost entirely with fillings consisting of but a single cylinder, with pellets or a narrow tape packed in around the edges; or in those methods of wedging where it is difficult to obtain solidity at the bottom of the cavity, where compression is effected by a wedge-shaped instrument, and is due, I think, to the filling being much more compact and solid at the top or external surface than within, making the plug to all intents and purposes a cone with the apex at the bottom of the cavity. It is very difficult to secure uniform solidity where the cavity is filled by a single cylinder. It must fit so tightly that the act of introducing it consolidates the top, and spreading it out increases the difficulty of reaching the bottom with our instruments, the space at the sides is entirely too small to allow of proper manipulation. Pellets may be packed in all round, but rarely reach the bottom where they are most needed.

I have been led to these conclusions by observing it seldom if ever occurs to fillings exposed to pressure in mastication, and also after removing frequently finding a ring of discoloration around the bottom of the cavity, indicating a want of accuracy at this point. They can be readily compressed to their original condition; the filling does not appear to suffer any other change, nor yet does decay set in around the edges, which would not be the case if this was caused by infiltration of moisture or the fluids of the mouth.

I have patients with fillings exhibiting this peculiarity which have been in position fifteen or twenty years, and to all appearances will last twenty years longer if need be. When compressed and burnished up, they remain in place a year or two, and gradually slip out again, and resume their former condition.

Again, we are told it cannot be used in each and every case, and is entirely useless in building out, or contour work. We admit adhesive pellets are more universal in their application, and heartily recommend their use in all cases where they have the slightest advantage. *Routine* has no place in dentistry; every single case that comes under our notice requires its own especial treatment. The proportion of cases where cylinders can be used advantageously, depends very much upon the skill of the operator; operations impossible to the novice are readily performed by the master. That it cannot be used in all cases is no objection against the system itself, and no reason why it should not be used where it can.

Why this wedging system should have declined, and be so completely lost sight of that but very few have any idea of its many advantages, after its long and successful career, is a mystery I cannot understand. Why it should be so completely ignored, and superseded by a system requiring so many complicated and expensive accessories to secure even partial success, and attended with so many inconveniences to both operator and patient, and depending upon contingencies so difficult to insure and maintain, is an unraveled enigma. Especially since the adhesive system, so far, if we judge rightly, has failed to satisfy its admirers.

If adhesive gold had proved a success, if it could be welded into a solid mass by the use of hand pressure why was the mallet required? And why this restless groping in the dark after a something to enable them to overcome a difficulty they have either not recognized, or are unwilling to acknowledge. I say groping in the dark—and who would not, after reading the proceedings of our societies, and the discussions in our journals on the mallet question, and seeing the ignorance of well-known mechanical laws so continually displayed? And again—why these continued radical changes in the instruments employed, this vacillation from sharp to blunt, from deep to shallow serrations, and then to none, if there is not an unsurmounted difficulty between present attainments and the desired success. We make all due allowances for individual taste; but when we see the same men, and they recognized as leaders in the profession, forever hailing every passing idea, old or new, as the good angel for which they have so long waited, we are forcibly reminded of a ship at sea without rudder or sails.

Do not misunderstand me; it is not the use, but the abuse of this system of adhesive foil filling, I condemn. Because it has proved successful in some cases where nothing else would answer, does not prove it has superior merit, or warrant its indiscriminate use in every case. It has done much to improve manipulative skill; the lessons we have learned by it, if properly used, are invaluable, and yet I cannot help but think it has been loved not wisely—but too well. It has elevated mechanical at the expense of artistic skill. The facility with which it can be packed or built out—the little real head-work required—has made the dentist of to-day more a gold-packing-machine than a reasoning, skillful artist. Why do we so often see their work so conspicuously and uselessly displayed—why so many pearly gems fringed or tipped with unsightly plugs—beautifully finished we admit—exhibiting alike the possession of skill and the want of judgment? With these we may class the building up of anterior teeth, an operation almost as artistic as a brass nose—a gilded eye—or a sky-blue wig. Strange perversion of ideas this divorce of skill and judgment. This attempted imitation of nature with such unsuitable material almost equals our early attempts at mince pies with ashes and mud. Nature is so far superior to art that the true artist, conscious of his imperfections, strives to hide his work when compelled to bring it in contact with nature's. As artistic dentists, it should be our constant aim to hide rather than display defects; and a tooth broken away so much as to be unsightly or useless, is far more skillfully and more permanently replaced by a pivot arrangement, so perfect and natural as to escape detection, than so hideous a deformity as a gold tooth. And now, in conclusion, allow me to ask a question on which the entire system of adhesive filling depends. Can gold be perfectly welded in the mouth? This is a question I have been trying to solve for a number of years, and after an extended examination am free to say, if it can I have never seen it. I have examined innumerable specimens of the work of others, some men of national reputation, who have made this system their especial study, and have never seen a filling I could not tear apart with an excavator; have never seen a filling that did not present lines of cleavage throughout its entire substance. They can be taken out of the cavity, and, *after annealing*, rolled into plate drawn into wire we admit, and so can a mass of foil or pure gold scrap, loosely pressed together with the finger as this has been done. If it were practicable to anneal the plug while in the tooth, when partially condensed, and then condense it over again, it might be accomplished.

In illustration. This filling was inserted by a gentleman whose work attracted my attention on account of its apparent solidity and beautiful finish. It contains nine sheets of No. 4 Eakin's adhesive foil, packed in with all the force of Snow & Lewis' automatic mallet, and every care taken to make it as solid and compact as possible. It was intended for careful and critical examination. After imbedding in plaster, to hold it firmly, the tooth and filling were carefully sawn asunder, and the two surfaces polished so as to get a smooth dead surface for microscopic examination.

With a power of but 20 diameters quite a number of flaws and defects, especially where the gold is in contact with the dentine, are readily seen. And so far from being perfectly welded, it readily breaks and comes apart on the slightest pressure. I do not lay any especial stress upon this case—we sometimes miss when we especially try to succeed; but this has been my uniform experience with *all* fillings I have examined; and it is this which leads me to place no dependence upon the cohesion of gold, and to express the opinion that fillings supposed to be welded are held together principally by adhesion, and that frequently there is but little more cohesion between the separate laminæ of a filling than between the laminæ of a piece of mica.

And now, in conclusion, gentlemen. We must not forget that the operation of filling teeth, no matter how much artistic skill we bring to bear upon it, is purely mechanical and amenable to mechanical laws, as fixed and immutable as the laws of nature. We must remember, the teeth we work upon are not blocks of steel or iron fixed upon granite beds, but vital structures, surrounded by delicate membranes and tissues.

We must accommodate our manipulation to the organs on which we work, and not imagine our patient's grinder a blacksmith's anvil, on which we can thump and pound to our heart's content.

It is well also to give some little thought to the object we have in view, and the best and most feasible means of obtaining it; and not forge with hammer and maul a mass of gold into an approximal cavity entirely shielded by its position from all mechanical injury.

Treat your gold kindly, gentlemen, don't handle it with kid gloves, and then pound the very life out of it. Treat your gold kindly—coax it gently in position, and it will adhere closer than a brother.

ALUMINUM BASE.*

[Read before the Association of German Dentists, held in Vienna, 1872.]

BY C. SAUER, BERLIN.

At the last meeting I gave you some account of my experiments with aluminum, and especially the examinations I made in regard to its durability in the mouth. At this meeting I intend to explain my mode of working this metal. During the past year I have been enabled to make considerable improvement and also to simplify it.

The process I will give you proves that whatever can be made with rubber (caoutchouc) can also be made with aluminum. Experience can alone prove whether aluminum can be considered equal to the rubber. I hope that my communication will have the effect of bringing this metal more into use, and thus we will be enabled in a variety of ways to examine aluminum and its alloys.

The process of working aluminum very much resembles that of rubber. As I formerly informed you, I make my casting upon the original model, and at the same time by the casting bind the metal to the teeth. The apparent simplicity of this work may lead subsequently into error. I will not weary you with a recital of the progressive steps taken in this investigation, but will only give you the advantages which I at present find in this process. There will be found many things incomplete in its practical working; but these, I hope, will be removed in time.

The principal labor in putting up an aluminum piece is the casting. If I intend to accomplish this perfectly I must strictly regard the melting point of the metal. The temperature of the material composing the cast model, as well as the teeth, must approach that of the melting point of the aluminum. The filling of the flask must shrink as little as possible in the glowing heat to which it is subjected. Great care is necessary not to allow the metal to decompose, to which it is very liable by the chemical changes produced by the heat.

Plaster, an excellent article for other purposes, is bad for this, as it falls to pieces in the heat, and would also cause chemical decomposition in the aluminum. But with substances containing gravel and pumice stone, it stands well at a high temperature. Clay has, by its composition, so near a relation to aluminum that it can, for this reason, be used as a filling for the flask. Its resistance to the effects of high temperature is an important consideration. For the same reason I consider graphite to be valuable. As the graphite contains carbon, it is liable to enter into combination with different gases during the time subjected to the glowing heat, and they are injurious to the aluminum, oxygen being one of these.

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* The failure of Dr. Sauer to forward drawings made the translation a difficult one for the translator, Miss L. Jacobi. We hope his ideas have been made clear without them; but it may be found difficult to understand the construction of the flask as well as if we could have properly illustrated it.—Ed.

The composition as I use it consists of

Plaster, - - - - -	1 part.
Pumice, - - - - -	½ part.
Clay, - - - - -	⅙ part.
Graphite, - - - - -	⅙ part.

This composition seems to me to answer the best purpose. It contracts very little in the glowing heat and casting, and becomes in the heated composition very fine and tender.

I must here, at the commencement, speak in opposition to the opinion that the cast aluminum plates do not fit in the mouth. They are as well adapted as the rubber work, the atmospheric cavity operating as well in one as the other.

The temperature of the teeth is, of course, the same as that in the filling of the flask, which, in casting, is red hot. Between the hot teeth and the melted aluminum there is probably an important difference of temperature unfavorable to the teeth. The pressure of the steaming aluminum on the glowing teeth is also unfavorable. I am forced to these suppositions by the result of some experiments. The teeth exhibited fissures after the casting, during the finishing process, or were cracked in the mouth without apparent cause. When the reason for this fault was clear, I attempted to prevent it by arresting the flow of aluminum just before it came in contact with the teeth, and by this means cooling it. The size of the casting (gussraum) for the plate involved me in other doubts. The casting plates must be as thin as possible, and yet must be free of holes. These will result if the pattern and the casting plates are too narrow or too unequal. I must, therefore, test the thickness of the pattern, the casting can then be made as thin as possible and free of holes. The composition of the filling of the flask is therefore of great consequence, as it in all cases must show the same contraction. I make my pattern in this way, that is, the diameter is from 1 to 1⅛ m.m., the casting is about the thickness of 1 m.m., and can be reduced at pleasure by filing. I roll plates of lead to ¾ m.m. It is very difficult to make them of greater thickness. The strength is increased by rolling tin to the thickness of 1⅛ m.m. The number of sheets of tin foil to be placed must be in accordance with the depth of the jaw. I make use of few in a small vault, many in a large one. The plates of tin are first placed on the model, to be followed by the lead plate. This plate is to be placed on as neatly as possible, at first with the finger, and then with a piece of wood rounded at the end.

Before I proceed further with the process I must describe the flask, the apparatus to warm it and the one to mould it.

The flask is of the same cylindrical shape with which you are familiar in rubber work. It consists of four pieces; two of them are cylinders of different heights and open at both sides, with two covers. The difference between these and rubber flasks consists in a hole in the side wall of the higher cylinder for the mould, and a tube placed upon the hole for moulding. The covers of the flask have on two sides opposite each other joined pieces, somewhat resembling a tuning fork. These joined pieces must stand exactly opposite to each other when the flask is closed. These are for two screws to bring together the covers of the flask. The screws end on one side with a button and on the other with a button. The latter runs in a box. The button and the box afford resistance when the different parts of the flask are brought together. The lower cylinder serves for the reception of the model, and has always on the under side a ledge. The higher cylinder gives position to the piece. The filling tube, which is placed to one side, is split its whole length, the upper and under parts being put together by a screw. The screw at the same time serves to secure the filling tube against the moulding hole of the flask. The filling tube has on the outside a small rim, and upon this is loosely placed a box. The channel is situated below the filling tube. The flask has on the outside of the moulding hole the thread of a screw. The tube by the rim is screwed by the box toward the flask, so that they form a continuation. A short funnel is screwed on the split filling tube at the upper part. This has on the inner side a width of 8 m.m., the thickness is 3 m.m., and has, excluding the funnel, a height of 8 m.m. The moulding hole of the flask has a conical shape toward the inner side. The button of the aluminum will, by this arrangement, be easily removed. This button has to be sawn off on the inner side of the moulding hole. I speak of this especially, because I always leave a moulding head (button) in the filling tube in proportion to its height. It gives the pressure under which I mould. I regulate the pressure in accordance with the height of the moulding head or button. I would especially call your attention to the width of the filling tube, as it enables us to use less material in the melting. All the experiments which I made, either with wide or narrow filling tubes, taught me that the wide would not produce such good results. The flask, with the filling tube and funnel, are of cast iron, and the two screws and box of malleable iron. The heating of the flask is done in an oven used for heating irons large enough to accommodate two flasks at the same time. In it is a box of cast iron, open on the upper and under parts, with feet to support it. On the inner side of the box are two rims opposite to each other on which to place the flask. The flask is laid down with the two covers. These are formed by the cover of the flask. This oven is covered on the outside by *chamotte*, (a very hard stone used for stoves,) the object being to confine the heat as much as possible. The oven is closed on the upper part by a plate of iron and *chamotte*. The whole is to be heated with gas. The cover has an opening for the moulding funnel, which serves at the same time the purpose of a chimney. The funnel is placed above this opening to facilitate the moulding. The covers and all the pieces of the flask have handles. This gas moulding oven or furnace I can also use for melting gold, &c., and I at one time melted in it seven ounces of brass. The melting furnace consists of a pipe of malleable iron, 26 ctm. and a width of 12.3 ctm. It is placed upon three feet of hoop iron 13.3 ctm. in length. The oven has on the upper and under part a rim of the diameter of 8 ctm. On the inner side is placed a compound of chamotte, mud and pieces of brick. This forms nearly a cylinder and is about 13.5 ctm. At this place on the inside are three iron wires to form a triangle. If aluminum is to be melted, a refining pot is placed upon the upper rim of the oven with one mark of the metal. Upon this upper rim is placed a chimney of conical shape, made of sheet iron 31 ctm. in height. Its diameter at the upper part is 4 ctm. This chimney is covered by chamotte three-fourths of its height. The funnel used is put on the oven to a height of 7 ctm. If you are moulding you have to cover the oven with the chimney.

I work in aluminum in the following manner: I make two models of one impression. One of these is of plaster, clay, pumice-stone and graphite, the second only of plaster. The teeth are ground, as indicated by the plaster model, put together on the base plate. They are secured by wax, and the bite taken. The piece is then placed with wax upon the plaster model. It is then placed in the flask with the previously described composition of plaster, clay, pumice and graphite. The back part of the model must be opposite to the moulding hole. The upper part of the flask is now put on the under part, and the wax patterns for the base are placed in, extending in a forked direction from the casting aperture to both sides of the arch. They are round on the moulding hole, and become flat on the end, but are here broader than on the former. They are then fastened on both sides and flasked and the cover placed on. This mode is adopted where the teeth are fitted directly on the jaw, but if not, then the manipulator must proceed as in rubber, placing the model in the under part of the flask, and the work with the teeth in the upper. If teeth with gums are used, they must close on the jaw, or they would readily spring. The more securely the teeth are placed in the plaster composition, the less likely they are to spring. The surest way is to place them on the model with plaster. Air openings should be made from the base plate to the edge of the flask. Use iron wire to make air openings from the interspace to the under part of the flask. The wire is to be removed and the openings filled with wax. All the other openings are cut after the flask is separated. The base plate and wax are now to be removed from the model. To avoid danger of springing, a wire of aluminum is placed at the distance of a ½ to 1 m.m. from the pins. This is secured in the composition of plaster. If the bite is not very high, I do not place in this wire, but if the bite is very high, as in gum teeth, several wires are used, one on the other. A wire may also be run in the vault below the gum teeth, in order, in the heat, to equalize the different thicknesses of enamel. The wax patterns are finally removed by boiling water, the part screwed on and both parts of the flask slightly warmed. To accomplish this they are very gradually heated, the temperature being slowly raised for three-quarters of an hour. At last there must not be steam enough escape to moisten the surface of a mirror. When they are thus well prepared they are screwed together, and placed in the warm oven and heated over the burner. The flask must still retain its black color. The furnace is now heated, and the aluminum, with pulverized coal, is placed in the graphite refining pot, covered by the chimney. This flue, pulverized coal, I have made use of since it was introduced by Franz Schulze, of Berlin, a manufacturer of aluminum bronze. When the aluminum begins to melt, the chimney is removed and the metal gently stirred until it is thoroughly melted. Then the slacks are removed and the melted mass poured out. The flask should be about blood heat. My experience teaches me that this temperature is the best to get a good mould and without endangering the teeth. The melted metal comes in contact with the wire in its passage to the teeth, by which it is prevented from too rapidly encroaching upon them, and is also cooled to some extent. If the melted metal is permitted to go direct to the pins of the teeth, these will, by the superior power of conducting heat, produce small fissures in the teeth before the metal has reached them. The flask must remain in the warm oven after the moulding to become thoroughly cooled. It is then to be separated, and the work cut out with a saw.

The finishing of this work is done in the same way as the rubber. If I polish, which I seldom do, I use steel with equal parts, by weight, of rum and oil.

Mending an aluminum case is only possible by soldering. The difficulty of accomplishing this is great, as all the aluminum solders decompose very rapidly in the mouth, and form an alloy with the pins more rapidly if they contain zinc or tin. The teeth will drop very soon from the soldered part. Both of these metals are to be avoided, all the more as the aluminum readily unites with an alloy. To avoid decomposition, I considered it best to take such metals which have in their electrical affinity the greatest contrast to aluminum. After many experiments with different kinds, I used for a long time a solder of gold, brass and aluminum. I thought I was obliged to have recourse to the zinc in the brass, but I was always disturbed by the decomposing quality. I observed that platina and aluminum alloy very easily. I, therefore, now use as a solder a composition:

Gold, - - - - -	2.9 parts.
Platinum, - - - -	0.1 part.
Copper, - - - - -	2.0 part.
Aluminum, - - - -	10.0 part.

This solder probably remains good in the mouth on account of the percentage of platinum, and does not, therefore, readily form an alloy with the pins. With it I have soldered platina silver wire on aluminum.

In forming the composition, the gold, copper and platina must first be thoroughly melted. I do this with coal powder in a small refining pot in the melting furnace, placed on the triangle and covered with the chimney. When it is melted I take off the chimney and place the weighed aluminum in a graphite refining pot, with the powdered coal in the upper part of the melting furnace, and again cover with the chimney. When the aluminum is melted I pour it in the refining pot below, filled with the composition. This is to be stirred. From the refining pot I pour this solder upon an iron, or what is better, a porcelain plate, and make it flat. If I want to solder I take from it a small piece.

I need for soldering a burner, tongs to hold the work, a thin piece of iron, easily bent, to place under the work to keep it in place during soldering, a composition of plaster and pumice-stone to flask it, and a soldering iron. This consists of a pointed piece, bent in the form of a screw. If it is desired to solder teeth, I protect them with a plate of aluminum and bend the pins against it. This plate, pins and the part to be soldered are to be cleaned from all foreign metal. The teeth are then placed on the piece with wax, and flasked with plaster and pumice-stone composition. In the plaster is placed a strip of plate iron, resting against the teeth. Plaster must not be placed beneath the teeth to be soldered. Finally, a piece of iron plate is bent to the shape of the jaw and secured below it. After securing the piece to the teeth to be soldered, the wax is to be removed. The whole is to be held above the flame of the burner until it is glowing. Solder is then placed on the point to be soldered. Where it is soft, carefully rub with the soldering iron against the gum and protecting plate. In soldering it is well to bear in mind two things: 1st, That the teeth do not become too glowing. 2d, That the first piece of solder is not too large and placed deep in the part to be soldered. Finally, I solder the protecting plate and the work on the back part of the gum.

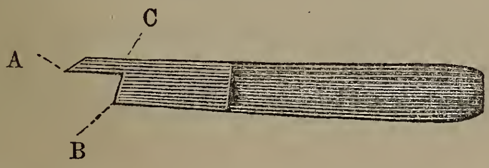
Recently I have used, instead of aluminum, a composition of aluminum and silver and one of aluminum, silver and platina. I found that when the casting has been made too hot, decomposition has taken place on the surface, after having been worn for a time. This, however, did not spoil the work. I therefore tried a composition of 95 aluminum and 5 of silver in hopes of better results, the silver being moro elastic than aluminum. As silver alloys readily with the platina pins, I placed in a small quantity of platina to prevent it. The results were very good. In a composition in which platina is combined, I could fasten clamps of silver and platina on the cast. This solder can also be used for mending.

SHOULDER CHISELS.

BY C. W. STAINTON, D. D. S.

At a meeting of the Eighth New York Dental Society, held in Buffalo, May, 1871, Dr. A. M. Holmes, of Morrisville, N. Y., exhibited a peculiar form of chisel, devised by himself, for opening into and shaping approximal cavities in bicuspids and molars. The chisels shown by Dr. H. were made from worn-out excavators. Subsequently, while attending the Pennsylvania College of Dental Surgery, I took the rude chisels I had formed from old excavators to Blake & Co., and from these as guides, had some chisels made with ¼-inch file-cut handles. This form of handle gives the operator perfect control of his instrument.

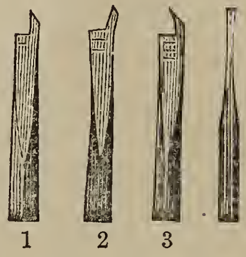
So thoroughly did these very simple instruments recommend themselves, that many of my classmates immediately obtained duplicates of them. To see the instrument is to convince the intelligent dentist that it is *just the thing*. All who use them are sure to feel thankful to Dr. Holmes for the simple, practical idea—an idea so simple that we wonder that we had not thought of it ourselves. The cuts, made from points furnished by Dr. Holmes himself, make the description very easy.



A is the chisel proper; B is the shoulder which, as the enamel or frail walls give way, rests upon the solid dentine or enamel, thus preventing the cutting edge from coming in contact with the gum, or the highly sensitive dentine at the bottom of the cavity, or still worse, the exposed pulp.

Every operator's experience teaches him that the chiseling of a proper dove-tailed cavity in an approximal surface, is tedious to the operator and painful to the patient. Considerable strength must be used to make the overhanging enamel give way, and when it yields, up goes the cutting edge into the most sensitive part of the cavity. I never worked at these cavities with ease to myself or comfort to my patients, until I got hold of these chisels.

Three forms of the instrument should be used. No. 1 for cavities in anterior teeth; No. 2 for anterior cavities in posterior teeth; No. 3 for posterior cavities in posterior teeth. Of each number, several sizes, differing in width and length of the cutting part, are desirable. The instrument must be made with the neck, C, a trifle narrower than the cutting edge, A, so that it will not bind in the tooth. The sharp edges of the shoulder, B, should be rounded slightly. Both Blake & Co., and S. S. White have patterns of these chisels. I have heard that the latter had them for sale, but I have looked in vain in the *Dental Cosmos* for any mention of them. Dental manufacturers would confer a favor upon themselves and the public by putting them in the market. I suggest, as the obviously proper name by which to designate them, "Holmes' Shoulder Chisels."



Lancaster, N. Y.

NEW MODE OF PIVOTING.

BY S. DAVIS.

I prepare the root as usually performed for ordinary pivoting, then ream the pulp-chamber in a funnel-shape to about the depth of a quarter of an inch, and in this cut anchorages. The root is frequently decayed in this shape.

A plate-tooth is then taken, and ground to fit the prepared root. It is then backed with gold plate. A portion of the sides of the tooth and backing are then ground off, leaving the labial surface the original size. A pivot is then soldered to the backing, and the frame is cut to the proper length, to allow the crown to leave a space of about a line between it and the root. Then prick the backing and pivot with a sharp instrument, and apply some oxychloride of zinc in the pulp-chamber, and force the crown and pivot into position. Gold is then packed into the anchorages, and built up around the pivot, bringing it well up on the backing.

When the crown and pivot are in position there are but two thin edges, about a line distant from each other, with plenty of space left at the palatine, *and proximal surfaces of crown for packing gold.*

The greatest obstacle in the way is to prevent the inflow of saliva; but I think this can be accomplished in most cases.

PARKER'S LANDING.

[A sample of this work has been kindly furnished us. The plan seems to be a good one in most respects, but we fear the line of gold at the neck will prove a serious objection to it.—ED.]

THE BRUNONION OR MOLECULAR MOVEMENT.

BY JAMES TYSON, M. D.

There are few facts in science which are so well known but that an occasional repetition of them would prove of service to certain individuals. But whether or not the number of these individuals be sufficient to justify the occupation of space in journalism, or the time of those who are familiar with them and would yet read them, may perhaps be doubted.

We have, recently, however, met such a signal instance of error* which has grown out of apparent ignorance of this well-known phenomenon, that we have felt justified in again briefly describing it.

The Brunonion or molecular movement may be defined as a peculiar oscillatory motion, attended with little or no change of place, which is common to all bodies sufficiently comminuted to admit it. In the early days of microscopic inquiry it was considered indicative of some vital endowment analagous to that exhibited by the spermatozoids of animals, and this was a conclusion, the less unreasonable since it was in the *fovilla* or granular contents of pollen grains that it was first observed. So early as 1827, however, Dr. Robt. Brown, of Edinburgh, announced that it was by no means confined to the fovilla, but was possessed by numerous

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*See a paper on "Infinitesimal Infusoria, or Vital Units," by S. P. Cutler, M. D., in the *Nashville Journal of Medicine and Surgery*, for June, 1872, a careful perusal of which paper must satisfy any one at all familiar with the elements of Microscopy, that the oscillatory movement here described as characteristic of living organisms is none other than this which is common alike to mineral or organic, to living or dead bodies, if they be sufficiently minute.

other substances, organic and inorganic, and therefore in no way characteristic of life. Indeed, all substances when minutely divided, exhibit it, although the degree of comminution which is required is widely different; substances which are light, as particles of indigo or gamboge, requiring to be less minutely divided than those which are specifically heavy, as iron or other metal. In almost all instances, however, the degree of division is so small as to require a power of at least 200 diameters, and in the case of heavier substances, the comminution necessary is so great that 400 or 500 diameters may be required to exhibit it.

To demonstrate this peculiar motion beautifully, we have only to rub up with water any light substance, as carmine, indigo or gamboge, or take any substance already finely comminuted, as the the ashes from a grate, and commingle it thoroughly with water; a drop of this mixture is then placed upon a glass slide, covered with a thin glass cover, and examined. To one unaccustomed to working with the microscope it is not at first easy to detect it, but a little examination will enable it to be seen, and once discovered it is readily detected in succeeding instances. It is also seen in all fluids of the animal body which contain finely comminuted particles, whatever their source. Thus the little particles of fatty matter constituting the "molecular base" of chyle show it beautifully. And we have no doubt but that the oscillatory motion of the granules in the so-called salivary corpuscle, the pus-mucus and white-blood-corpuscle, are identical in nature, whatever the cause. But the oscillatory motion peculiar to the well-known organisms called vibriones, which appear so promptly in all animal and vegetable infusions, must not be mistaken for it, since the motion of the vibrio is attended with change of place, and molecular motion is not.

The exact cause of this peculiar motion is as imperfectly known now as when it was first noticed. That evaporation, once suggested as a cause, has nothing to do with it, is easily proved by cementing down the thin glass cover of a preparation in which it is taking place. The writer has in possession a slide of minutely divided gamboge particles exhibiting this motion, which was prepared and the cover cemented down two years ago, and the movement still continues. Though heat accelerates it, it is by no means a cause of its existence, and the most that can be said with regard to it is that it is due to some physical action rather than chemical, perhaps, taking place between the particles and the fluid in which it floats and which is increased by heat.

Leading Articles.

THE AMERICAN DENTAL ASSOCIATION.

This Association assembled at Niagara Falls on the sixth of August. The attendance was large; most of the Northern, several of the Southern, and the Pacific States were represented.

According to the rule of this Association, it enters at once upon the consideration of topics connected with the profession, other business being transacted at such times as the meeting may direct. The reports on Pathology, Physiology, Chemistry, Operative Dentistry, &c., were taken up in regular order, and elicited much discussion. That on pathology brought out a long verbal report, occupying an entire evening in its delivery. The treatment of these topics elicited nothing especially new, except that on physiology, which gave Dr. Allport's theory of the dependence of the sensation of teeth upon the connection supposed to be kept up between the horns of the pulp and the dentine. We could not discover that this, rather peculiar, theory was supported by anything more than the observation of one person, and entirely at variance with the conclusions of previous observers.

The report on operative dentistry was, in the main, a good one. It fairly gave the general points of progress made in this department; but while it did this, it also gave evidence of lack of information of work done in previous years. This was particularly marked in the part devoted to bleaching teeth; more industry in hunting up facts bearing on a given subject would enhance the value of the productions. The discussion on this paper was interesting, and occupied a large portion of the time of the convention, but this time was entirely too limited. The past year has been prolific in new ideas or development of old practices in new directions. It would have been very gratifying to have been able to have devoted hours to the consideration of Dr. Arthur's method alone, but the subject was scarcely touched upon. So with other matters. This will always be the result when business is transacted as here. If reports would take up improvements in chronological order, and discussion limited to a special matter, each subject would receive proper attention. As it is, each speaker is limited to fifteen minutes to speak on matters that could and should occupy him hours. The result is a skimming over prominent points, and general dissatisfaction.

The subject of dental education came up in a well-written report. The usual cheap abuse of dental colleges was indulged in. Colleges are but the creation of fallible human intellects. We would be heartily rejoiced to see the standard of education advanced, but this will not be accomplished until the Faculties are made independent of students. We may build beautiful theories of perfection, but the superstructure will tumble into a crumbling ruin if not reared on a strong foundation. Those who are new to college work are apt to see things in rosy hues, but the bright colors will fade in the strong light of experience. Those critics entirely outside of all experience, have no judgment at all, and are unworthy extended notice. All that can be said of colleges is, that they fall far short of the best ideal of their own Faculties and that of the most cultivated of the profession, and changes, if any, must come by slow and progressive steps.

Previous to the final adjournment, some important changes were proposed in the constitution. These lie over until next year.

We have not presented any regular report of the proceedings for this journal, preferring to give this resumé.

In an association of this kind, words dominate ideas, theory supplants facts. Organized as it is, it can never be the exponent of advanced thought. It assumes the character of a general clearing house for all kinds of ideas. We are not prepared to believe that, imperfect as it is, it has accomplished nothing. The social aspect is of immense value. Men from distant sections cannot be too often brought together. The interchange of ideas is a mental barometer to indicate to each other the height and depth of his position. We need this regulation continually. The orbit of a man who constantly revolves round his own intellect, becomes narrower and narrower, and is finally lost in insignificance. Progress requires, therefore, just such mingling; but the question arises, can it be improved? We think so.

A notable effort was made in this direction at this meeting. Heretofore, individuals appointed to bring in reports, took very great latitude in their preparation. Instead of confining themselves to a collection of new views, new facts and the results obtained, lectures, verbal and written, have been given, occupying the valuable time with matter, good it may be in itself, but not fitting to the place and occasion. This was carried to an unendurable extent at this meeting. Two entire sessions, or one-fourth of the time, was occupied in this way. Many of those present felt that this must stop, or the value of the association would be entirely lost. Resolutions were introduced instructing the publication committee to omit the two reports, alluded to, from the transactions. These were finally adopted. We regret that this course should have given rise to the personal feelings indulged in by the gentlemen directly interested, and those who constituted themselves their special defenders. Private wishes and feelings must always be held subordinate to the general good, and that the resolutions contemplated this, no one can deny. Mere personal feeling had nothing to do with their introduction. There seemed to be no other way of meeting the difficulty, and that it must be met, was apparent to all intelligent observers. If the gentlemen aggrieved had received it in this light, much acrimonious discussion and subsequent ill feeling would have been obviated. An association of this kind loses a proportion of its independence when shackled by mere personality. Intellectual weight goes for a great deal in such associations; but when it assumes tyrannical proportions, and undertakes to insist on the lion's share, regardless of the rights of others, it becomes the imperative duty of those present to resist it. If any are wounded by this healthful operation, it is to be regretted, but the sum of gain to others will counterbalance the temporary infliction.

The most extraordinary proceeding that probably ever was enacted in a convention governed by parliamentary usage, took place when the election for officers was called in regular order. On the first ballot a large number of those present were voted for to fill the office of president. Dr. Buckingham, having the largest vote, was declared ineligible by the president, on the ground that he was a delegate, and delegates were not entitled to hold any office in the association. An appeal was at once taken from this decision, that it was contrary to the express language of the constitution, which declares: "The members of this association shall be of two classes, *delegates and permanent members, having equal rights and privileges.*" The appeal was looked upon, by some of the permanent member clique, as a species of impertinence on the part of the one making it, and one member waxed very wrathy over it. The association sustained the president in this most unjust decision, and delegates were entirely deprived, not only of the right to vote, but to serve on any of the committees. We were astonished at the time that the president should have so promptly ruled as he did, but we have since learned that a caucus was held the first day of the meeting, at which it was decided to take this course. He was, therefore, acting under instructions. When it is remembered that this association was originally organized as a representative body, and that the constitution forbids any member from becoming a permanent member until he has served one year as a delegate, the absurdity of this decision becomes more apparent. It passes our comprehension that a presiding officer should allow himself to be the instrument to commit such a high-handed violation of law. The only pretence for this action, for it does not assume to rise to the height of an argument, is based on the supposition that the term of service of each delegate expires with the close of the sessions of the association to which he is sent. This will not bear examination. It has been the rule to wind up the business by the election of officers, appointment of committees, and such other matters as may be necessary toward organizing the meeting next succeeding. In other words, the meeting recently held at Niagara elected officers on Thursday and installed them on Friday, and the sessions of 1873 were fairly begun. These officers and committee-men hold over until the close of the meeting in 1873, when a similar process is gone through with. Now a strict construction would assert that a delegate elected in 1872 to attend the association, could not properly fullfil his duties until that of 1873 commenced. In that case he continues his office as delegate until the expiration of the session of 1873. Under such a construction he would not have the right to vote for officers in 1872, but would have in 1873. But the constitution makes no provision of this kind, and by common consent delegates have been received as members at the meeting to which they were accredited. If this be considered the meeting of 1872, and that of 1873 commencing in August of the following year, it follows that the association holds over, and all connected with it must do the same; therefore the office of delegate does not expire by limitation until the August meeting of the year following that to which he is appointed. The matter is so plain that we ought to apologize to our readers for taking up so much time with it. It is, however, of vital importance. If subordinate associations have no rights in the so-called American Dental Association, the sooner they are made aware of the fact the better.

At the next meeting to be held at Put-in-Bay, the amendments of the constitution, which contemplate a change in the article alluded to, will come up for action. We hope every association will be fully represented. We need, and must have a representative National Association. If this fails to be one, it will be then time to consider the propriety of making radical changes. We trust, however, that wise counsels will prevail, and that the American Dental Association may still have a future full of value to the profession.

PROF. BURDON-SANDERSON ON THE STUDY OF PHYSIOLOGY.

We believe we give expression to a sentiment common to the mass of the medical and dental profession, when we say we deem the position taken by Dr. Burdon-Sanderson, with regard to the science with which he is identified, to be an unfortunate one. His views, promulgated in an address before the Physiological Section of the British Medical Association, are substantially these: that physiology is a distinct science, as distinct from medicine as physics at the present day—that it should be prosecuted as independently of medical courses as is physics.

While we would encourage those who are not physicians to study physiology to any extent they may desire, we decidedly object to a separation of physiology from medical and dental courses. Indeed, a moment's reflection would seem sufficient to impress the most superficial thinker that their separation is quite impossible—as impossible as to disassociate sight from the eye, or hearing from the organ appropriated to this function. According to our own ideas it might with as much propriety be suggested to separate anatomy from medical studies as to disassociate its inseparable twin sister, physiology.

Were we, however, to say no more than this, Dr. Burdon-Sanderson might with great justice accuse us of superficial reading and careless interpretation of his views. We cannot conceive, on the other hand, that the professor ever intended to disassociate physiology, as commonly understood, from medical instruction. How, then, could he give expression to the views we have announced as emanating from him? We perhaps lay ourselves open to still graver accusation when we say that we believe his position to have been taken from an erroneous conception of what constitutes true physiological teaching; though we believe we can explain ourselves to the satisfaction of most of our readers. The attention of teachers of physiology has lately been largely directed to what is termed *practical physiology*. Now there are, perhaps, few terms which admit a more general application than this one of *practical physiology;* the best evidence of which is seen in the different plans of teaching adopted by the different London professors, since some knowledge of it has come to be demanded by the examining boards. One makes vivisections and the application of different forms of apparatus, including the use of graphic apparatus and of "schemes," to illustrate the purely physical portion of the different functions, the basis of his course; another adopts practical histology as the fundamental part of his instruction, and pursues it to the exclusion of all else. Another places in the foreground physiological or medical chemistry, including such processes as the so-called artificial digestion and urinary analysis, while a fourth announces that the phenomena of disease as observed in clinical wards, and interpreted by the lesions discovered in the post-mortem room, constitute the essence of practical physiology.

Now Prof. Sanderson is the representative of what may be called the "physical school of physiology," and his recent course of lectures at University College, as reported in the *Medical Times and Gazette*, will bear out this assertion, as those who have read them must admit; while they also admit that it is often difficult clearly to understand the application of the various forms of complicated apparatus employed, though the lectures are liberally illustrated by wood-cuts. Moreover, we are willing to concede that thus much of physiological teaching might be separated from medical teaching, though we feel confident also that the interest of those pursuing it would be much enhanced, while the understanding of students of medicine in the functions they are striving to study would be greatly facilitated by practical illustrations of the kind referred to. But this physics of physiology is clearly a very small portion of the science of physiology, though a distinct and acknowledged part of it. Is it not important that the physician should understand the phenomena of digestion and the offices of the nervous system? And surely these cannot be learned from physics alone. Again, the function of circulation, which affords more extensive opportunity than any other for the use of the physical method of teaching, would have been undiscovered in its essential particulars, but for the stimulus of the demands of medicine upon the physiologist. Equally important to the physician is histology, a knowledge of which is only possible through practical opportunity. Certainly Prof. Burdon-Sanderson would not remove pathology from the domain of medicine, and yet a knowledge of pathology would be as imperfect without a knowledge of physiology as that of astronomy without the telescope, or histology without the microscope.

Is it not possible, then, that the position of Prof. B. is based upon too limited a view of what constitutes physiology? If it were but physics applied to physiology, its separation from medicine might appear reasonable; and even then there must be greatly diminished interest in its pursuit. But since it includes also, by common consent, physiological chemistry and histology, and is the basis of pathology, we hold that instead of becoming separated from the study of medicine, it must become even more closely allied to it, and that in order to become better practitioners of medicine we must become better physiologists.

DONATIONS.

Since the last issue of the Dental Times we have received the following donations to the Museum of Pennsylvania College of Dental Surgery. It is gratifying to notice the continued interest manifested by our professional brethren, by placing objects of value and of interest where the greatest number can be benefited by their inspection. To the donors we tender our thanks.

From Dr. J. S. Smith, of Columbia, Pa., a plaster model of an upper and an under set of natural teeth of unusually large dimensions, the extreme breadth being $2\frac{7}{8}$ inches.

We are under obligations to Dr. F. L. Neff, of Harrisburg, Pa., for a beautiful specimen of the œsophageal teeth of the Fall fish.

We had the pleasure of a visit from Dr. Samuel H. Linn, of St. Petersburg, Russia. The Doctor is here for a short visit, and will return to the city of his adoption, where, in connection with Dr. Murphy, he has a large and lucrative practice. We are under great obligations to him for the following specimens, presented to the Faculty of the College:

1. A papier maché model of a molar tooth, exhibiting the general and histological features very beautifully.
2. A number of carved bone teeth, several mounted with natural and artificial teeth.
3. A regulating case, specimens of tartar and abnormal teeth.
4. Two instruments for extracting, one modern and the other older style.
5. Porcelain teeth manufactured in Europe.
6. Deciduous tooth of an extinct rhinoceros.
7. Superior maxilla, with canine tooth abnormally developed.

From Mr. Geo. R. Welding, editor and proprietor of the *Dental Office and Laboratory:*

A molar tooth having a bed of enamel situated upon the root about half way between the neck and the apex of the roots; a very interesting specimen. Extracted by Dr. R. L. Burgess, of Fort Scott, Kansas.

A molar tooth having three roots of an abnormal formation, two of which stand at near right angles to the axis of the crown. Extracted by Dr. S. S. Walker, of Effingham, Ill.

A dens sapientiæ with four roots and a deformed crown, two molars with four well developed roots, three molars and two bicuspids with largely exostosed roots, and a canine tooth with an unusually long and crooked root, all of which are valuable and interesting specimens. Extracted by Dr. G. W. Hall, of Cortland, N. Y.

Two inferior molars, with three well-formed roots, taken from the mouth of a young lady; also right and left upper molars, with two roots, taken from one patient; the peculiarity of the latter is, that each have on the surface of the roots a bead of enamel resembling (as the donor styles them) pearls; valuable specimens. Extracted by Dr. S. Musselman, of Brantford, Ontario, Canada.

A deciduous tooth taken from the mouth of a gentleman thirty years old, a supernumerary tooth, an exostosed root, and a bicuspid with three well-formed roots. Extracted by Dr. A. W. Smith, of Sedalia, Mo.

A dens sapientiæ with three roots standing at near a right angle to the axis of the tooth. Extracted by Dr. Wm. J. Miller, of Galesburg, Mich.

A lateral incisor with the root malformed, standing at an angle of forty degrees from the axis of the crown. Extracted by Dr. Nelson, of Boliver, Tenn.

A right superior molar having a piece of the jaw-bone imbedded between the roots, to which they appear to be united by an ossific deposit. Its true character will receive further attention by a microscopic examination. This tooth is one of four extracted from the mouth of a negro woman, aged forty-five years. Extracted by Dr. D. B. McHenry, of Sardis, Miss.

We are requested to call the attention of those interested in the Electrical Mallet, to the advertisement of Dr. Bonwill.

We regret that any difficulty should have arisen to prevent the immediate general introduction of this perfected and valuable instrument; but as the case has been re-opened, it may be well to await the decision of the proper tribunal.

FURTHER EXPERIMENTS ON THE EFFECT OF DIET AND EXERCISE ON THE ELIMINATION OF NITROGEN*

BY E. A. PARKES, M. D., F.R.S.

This lengthy and very interesting paper contains the account of a series of physiological experiments very carefully instituted by the author, assisted first by Count Wollowicz, and afterwards by Sergeant Turner, of the Army Hospital Corps. The subject of the experiments was a perfectly healthy soldier 25 years of age, who weighed 145 lbs., and was a very powerful man, having been an iron-worker (puddler) before enlistment; the series of experiments made are: first, ordinary regulated diet, including the careful determination of the amount of excretions, and the determination of the nitrogen therein contained, also the mean pulse and mean temperature of axilla and rectum. The second series of experiments with prepared concentrated food was discontinued in a short time, owing to the food causing indigestion. The third series of experiments with non-nitrogenous food was conducted in all particulars as the first series. As general results the author points out that, with regard to the temperature, it may be concluded that a non-nitrogenous diet continued for five days neither raised nor lowered the temperature of the axilla and rectum; it also appears that when the nitrogenous food of a healthy man was reduced to one-half for five days, and he was then kept for five days without nitrogen, he was able, on the fourth day after such deprivation, to do a very hard day's work. The non-nitrogenous food, consisting of butter, oil, starch, and sugar, kept him perfectly well, all the functions seemed natural, the man felt in all respects healthy, but on account, however, of the feebleness of the heart's action, it was not thought proper to continue the experiments, which, according to Dr. Parkes' opinion, had sufficiently proved that force neeessary for greater muscular work can be obtained by the muscles from fat and starch, though changes in the nitrogenous constituents of the muscles also go on which have as one effect an increased, though not excessive, elimination of nitrogen after the cessation of the work.

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* Abstract of a paper read before the Royal Society.

Proceedings of Societies.

AMERICAN DENTAL ASSOCIATION.

The following resolutions of general interest were offered and adopted at the August meeting of this Association:

Whereas, The American Dental Association, at a meeting held July, 1864, used the following language in resolutions then offered:

> "Whereas, Dr. Horace Wells, of Hartford, Connecticut, in the year 1844, did introduce to the public in his practice of dental surgery, nitrous oxide gas as an anæsthetic for the painless extraction of teeth; and
>
> "Whereas, Nitrous oxide gas, as exhibited by Horace Wells, proved absolutely successful, as is confirmed by abundant documentary evidence at hand, clearly setting forth his claims, as the first to bring to public notice any agent producing anæsthesia; therefore be it
>
> "*Resolved*, By the American Dental Association, That to Horace Wells, of Hartford, Connecticut, (now deceased,) belongs the credit and honor of the introduction of anæsthesia in the United States of America, and we do firmly protest against the injustice done to truth and the memory of Dr. Horace Wells in the effort made during a series of years, and especially at the last session of Congress, to award the credit to other person or persons."

And Whereas, While desiring to reaffirm our belief in the indisputable character of the evidence, upon which this discovery is claimed for Dr. Horace Wells, we are also forced to believe that the dental and medical professions have neglected a plain duty in failing to give some substantial evidence of their appreciation of the inestimable value this discovery has been to the world, and of the estimation with which they hold the memory of the discoverer; and

Whereas, We have been informed that the family of Dr. Horace Wells was left wholly unprovided for, and have struggled through the twenty-eight years that have elapsed since the discovery was made, we, therefore, recognize the bounden obligation we are under, even at this late day, to recompense them for the labors of the husband and father; therefore be it

Resolved, That this Association most cordially approves of the efforts now being made in the dental and medical professions to raise a fund, to be known as the "Wells' National Testimonial Fund," and they would earnestly ask the co-operation of all dental associations in the country to forward this work, and would also impress upon every individual member of the profession the importance of doing all in his power to make this not only a credit to his profession and a substantial gift to the family of Horace Wells, but an honor to the memory of one of the greatest of the world's benefactors.

The following preamble and resolution, offered by Dr. Peirce, were adopted:

"Whereas, The Declaration of Independence of the United States of America was prepared, signed, and promulgated in the year seventeen hundred and seventy-six, in the City of Philadelphia, and the people of the United States having decided to celebrate, by appropriate ceremonies, the centennial anniversary of this memorable and decisive event; and Congress has, by appropriate legislation, appointed a Commission, whose duty it is to prepare and superintend the execution of a plan for holding this exhibition; and this Commission, in session in Philadelphia, has expressed the desire that statistics shall be collected relating to all matters that shall indicate the progress this country has made in the first century of its existence, and that all associations, religious, educational, industrial, &c., shall take such measures as will make the statistical department of the exhibition in 1876 as complete as possible; therefore,

"*Resolved*, That this association, now in session, shall appoint a committee of eleven, whose duty it shall be to prepare and present to this Commission such a report of the progress and position of our profession as, in their judgment, is consistent with the results of our efforts for the improvement of the physical, intellectual and moral condition of man."

The following committee was appointed:

Philadelphia—C. N. Peirce, Louis Jack; New York—C. E. Francis; Boston—L. D. Shepard; Cincinnati—J. Taft; St. Louis—A. Judd; Chicago—G. H. Cushing; Nashville—W. H. Morgan; New Orleans—J. S. Knapp; Washington, D. C.—Dr. Noble; San Francisco—W. Dutch.

Resolutions were passed, fixing the place of meeting of the association at Philadelphia, for the year 1876, and a committee was appointed to correspond with the leading men in the profession in other countries, to secure a full representation.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a meeting of the Association, held April 9th, 1872, Dr. Wm. H. Trueman read the paper, offered by him for consideration at the meeting of the Alumni in February. The Essay was presented at too late an hour for proper discussion at that meeting, and, by unanimous request, it was again read at the Pennsylvania Association, to enable the members to consider its positions.

At the conclusion of the reading, Dr. T. presented some instruments adapted to his mode of filling.

Dr. Jas. Truman opened the discussion by remarking: We have fallen upon strange times in our profession. While the active mind in it is reaching out to grasp the new and untried to an extent never before witnessed, there are others who are groping for truth in the almost entirely abandoned practices of the past.

What do we understand when we use the term soft or non-adhesive foil? Are we correct in our definitions and ideas? My understanding of the qualities of gold, and my remarks in considering the paper of my friend Dr. Wm. Trueman, are based on gold as I understand it. Non-adhesive, then, is that form of beaten gold that is absolutely soft, and is *entirely without cohesive properties*. Adhesion is that where the material has the property of cohesion, whether this be to the fullest extent attainable or only in moderate proportions.

Non-adhesive was the form in which gold was usually prepared in former years. Operations could not be successfully performed by any other, because the modes, then in use, admitted of nothing but gold possessing softness and non-cohesiveness to the largest possible degree. Of what advantage would the cohesive property be in a tight-rope, the oldest form of filling? When pellets were introduced of the grain of wheat form, this quality was still needed; and the subsequent introduction of the cylinder, a modification of the pellet, made it still more desirable. Now, this form of gold, though yet in the market, is rarely met with in dental offices; but the moderately adhesive has taken its place, and by many supposed to be strictly the non-cohesive gold of former years. That confusion of ideas has arisen, from this misunderstanding, I am satisfied. I do not charge the writer of the paper with this error. He is too well informed to make such a mistake; and I shall, therefore, endeavor to answer him solely on the merits of the proposition, Which is the best form of gold to use in the largest number of cases coming into our hands?

To understand the subject properly, allow me to revert to modes adopted in former years. Dr. Harris says, in his "Principles and Practice of Dental Surgery," that "The gold should be cut into strips of from half an inch to an inch wide. Each of these should be loosely rolled or folded together lengthwise; and after the cavity has been properly cleansed and dried, one end of one should be introduced and carried to the bottom of the cavity, with a straight or curved wedge-pointed instrument; the roll should then be folded on the part first inserted. The folding should be commenced on one side of the cavity, and the inner end of each fold should be taken to the bottom, and the outer should extend nearly the eighth of an inch on the outside of the orifice, and then fold after fold should be introduced until the cavity is tolerably well filled." He then used a wedge-pointed plugger to force through the centre of the filling, pressing the gold against the walls. The opening thus made is again filled, and so on to completion. Now, this is substantially the process that all use who have adopted any of the forms of non-cohesive foil. The result in many, perhaps the majority of those treated, was good, but they could not be considered perfection. If I understand the object of filling, it is to render the cavity wholly impervious to moisture from without, for it is to the moisture of the mouth that we must look for the development of the destructive agents. In proportion, then, as we accomplish this will be our success; and the reverse of the proposition is necessarily also true, that the softer we have our filling the greater number of interstices will be left for the accomplishment of this undesirable end. It is no argument that many escape this destructive operation.

This brings us to another proposition: Can this form of gold ever be made as solid? When the gold is prepared, either in rope, pellet or cylinder form, it is composed of a series of laminæ of such a character that close packing is impossible.. The laminæ may crowd against each other, but there is no union. The particles roll upon each other, and minute spaces are left, that, in the aggregate, make up a large proportion of the cavity. With the same propriety you might attempt to make a barrel of shavings, by packing, assume the density of the wood from which they are taken. If, then, you fail in perfect solidity, you fail just in that proportion in the prime prerequisite of a filling. To secure greater density immense force was and is employed. Instruments, with large handles, are necessary to bring the whole force of the arm to bear on a yielding jaw. Wedge form of instruments are used to give lateral pressure and drive the gold against the walls. When these are strong this may be done with impunity, but when weak, danger is always imminent. Our essayist asserts, if I understand him, that while the laminæ are closely compressed there is not necessarily any strain on the walls. I cannot understand this theory. If we have force at any point that force will be distributed to the entire body, and the last layer will receive it, and it, in turn, transfer it to the walls. If these be strong, or the force applied be moderate, they may stand, but if too powerful, one or both must give way.

Another objection is, that non-cohesive foil is not applicable to cases constantly met with. It is not possible to fill cavities satisfactorily when but two walls are standing, and not at all when only one remains. The warmest advocates admit this, but assume to believe that these are exceptional cases, when we all know that they are by far too frequent for the comfort of the operator, even with the most approved modes of operation.

I have still another objection. While it must be admitted that fillings may be placed in more rapidly, it is always at the expense of solidity. With hand-pressure there is a limit to the rapidity of execution where absolute solidity is desired; but, with non-cohesive, any time within the conscience of the operator is all that is required. The strength necessary to perform this kind of work is beyond the endurance of most men. The destructive effects have silent witnesses in every cemetery the land over. We gain in rapidity, but at the expense of health. We make more money, but the early grave is the chief prize worked for. If there were no other reasons to be brought against this form of gold, this alone should condemn it in all philanthropic minds. I know our friend does and will contend that this is overstated, but I speak from an experience that covers ten years in the practice of non-cohesive foil, and the knowledge then gained would ever force me to lift a warning voice against the use for this alone.

I am willing to admit that this form of foil has its use, and in that position it is invaluable. It is true that it will adapt itself to all irregularities better than adhesive. There is no clogging of the material. For this reason I have always taught that a layer of soft foil is preferable along the walls of cavities, not that adhesive foil may not be packed equally as well, but the care required will be greater to insure perfection.

Now, in regard to the objections made by the gentleman to cohesive foil. He doubts the possibility of making gold so solid that it will resist the action of mastication. I can but express my surprise at this statement. The wear in a perfectly solid filling is so small that in years of constant use it is scarcely perceptible to ordinary observation. It will resist that action better than the enamel. The latter is not only affected by wear, but the action of the acids of the mouth are constantly softening and predisposing it to loss by attrition. Not so gold. It wears away, of course, with the loss of tooth substance, but it will ever remain flush with the walls. His assertion that adhesive foil fillings are more liable to break away at the edges is unsupported by proof. It does not coincide with the experience of those in its constant use, nor can I discover any good theory upon which to base it. If the gold is perfectly welded it should not disintegrate there any faster than a melted ingot. That crystal gold breaks at the edges, is well known, but we are not now considering this form. I can agree with our friend in his definition of the difference between solidity and hardness, and also agree with him that the former quality is indispensable to a filling, and for this reason I hold that that which will most certainly attain this is the mode best adapted for our purposes. Now, I think his objection to adhesive has, perhaps, grown out of a misconception of the modes usually adopted to insure perfect success. As I watched him folding his gold it was impossible to come to any other conclusion than that failure must result—and why? Gold foil, as he truly remarks, loses its welding or cohesive property in proportion as the laminæ are compressed one on the other. If we roll the gold tightly, as he described, the loss of cohesive property is immense. To get the best results gold should not be rolled at all—but this is inconvenient. We, therefore, make it a rule to roll no more than will enable us to handle it conveniently. If we use the tape form, it should be made with the same care, and for similar reason. With a rope, such as he described, failure must inevitably result. I am not, therefore, surprised that his faith in adhesive foil is so small. I should be astonished had he any. Now, if we use cohesive gold, as described, and take ordinary care in packing from retaining anchorages, what must be the result? Every part of the cavity must be thoroughly filled, because every particle of the material is watched from its first insertion until it is condensed. There need be no doubt about this. If it be used in large pellets, and crowded in in utter disregard of its peculiarities, there will be only partial cohesion, and a continual bridging over, leaving a series of minute cavities. But, in a properly packed cavity, I have failed to discover any such result. I am aware it is customary to assert that serrations cause just such pits. If so, it will require greater powers of definition in our microscopes to find them. That there are degrees of solidity in adhesive foil fillings there can be no doubt. The difficulty of applying force to a movable object cannot be overcome without an increase of velocity applied to the force; hence, with hand-pressure, perfection in this respect can never be expected. But the difference between a perfectly solid filling, placed in by the electric mallet, and one by hand-pressure is not of material consequence, as it is too slight to affect the integrity of the tooth.

His assertion, that malleting seriously injures tooth structure, cannot be proved, I think. I have never seen a case of injury where the work was carefully performed. A sudden blow with a heavy instrument might be very injurious, but that only proves there is a proper as well as an improper way of performing it. It is something new to be told that adhesive foil fillings are more liable to fall out. The percentage of loss is very small with those who use cohesive foil upon proper principles. The great advantage of this form is that it can be secured in almost every case with anchorages that will defy loss. In fact, it may be asserted that he who habitually loses fillings has mistaken his calling. Not so, however, with soft, non-cohesive foil. But few operators ever have or could rise to the ability of perfectly securing this in cavities, so that when the teeth left their hands they could confidently rely on seeing the fillings again months or years after. In cylinder and other forms of non-adhesive gold, the filling is necessarily of unequal density. The surface is crowded down harder than the underlying portions. The result is unequal contraction and expansion. The hard part is forced out and beyond the walls; and as there is no union of particles, it there remains, to the destruction of the tooth, unless removed. Now, this never occurs in cohesive foil fillings.

Our friend thinks adhesive foil is losing ground. It may be that this is partially true; but it cannot be owing to any defect in the system itself. We have to contend with many difficulties in our work—the most formidable of these being the unequal quality of the gold used. I do not mean by this that the gold may not be of equal fineness; but that, let it be ever so fine and of good quality on leaving the manufacturer's, it is sure to degenerate in proportion to the time it is kept before using. The reasons for this are set forth fully and exhaustively in that admirable paper of Dr. Black, of Illinois, in which he conclusively proves that acid gases will destroy the cohesive property of any gold. Annealing may, to a certain extent, restore this; but more often renders it harsh and unyielding. Now, as all dentists have not the time or ability to restore this gold to normal conditions, there must necessarily be great difficulty in using it at all. Where such is the case, discouragement follows, and the cry is for soft gold; that is not injured by such conditions. While this difficulty is to be regretted, it in no degree lessens the value of cohesive gold in proper condition. It must have been some such gold as I have described that was used to fill the sample-case our friend mentions. I am perfectly well satisfied that he could by no ordinary force return any properly-placed adhesive foil filling to its original lamina. He might chip it to pieces, but nothing more.

In conclusion, allow me to express my unbounded confidence in adhesive gold for filling. Fifteen years of constant and almost entire work with it has taught me to entertain but a poor opinion of my own operations of previous years, and equally poor opinion of that done by others who use non-cohesive foil exclusively.

Dr. David Roberts remarked: I have been filling with cylinders for many years, and have found that form the most satisfactory and useful for the generality of cases. The only objection I have found to them is the amount of pressure required in condensing fillings for sensitive and shrinking patients. Some cavities I cannot fill with cylinders and have used Watts' crystal or adhesive gold foil. I cannot agree with Dr. James Truman, that cylinder fillings cannot be made thoroughly solid. I use Abbey's No. 4 and 6, non-adhesive and Eakin's semi-adhesive foil.

Dr. **Darby** said: There was a misunderstanding as to the form of cylinders. I think Dr. W. Trueman rolls his over a broach. I object to this mode, as it hardens the gold. I am glad to find Dr. Jas Truman has modified his views. Children's teeth should be filled with cylinders. Any other form increases the amount of time. No one can be more thankful than myself for adhesive foil, but no one can adhere to one class of foil. The practice must be eclectic. I have seen operations with cylinders that had been placed in twenty years ago, and are just as good and beautiful at the present time as when first placed. The cavities presented by Dr. J. Truman, could not be filled by cylinders, but I think where the walls are intact these could be placed in. Dr. Truman did not teach cylinder filling. I have known of students going elsewhere on account of adhesive foil filling being the only mode taught in the Penna. College of Dental Surgery. Dr. T. taught and practised filling children's teeth with adhesive foil. This I think is wrong, as a greater amount of time is required, more than children can endure.

Dr. J. **Truman**, in answer to Dr. Darby, said: I am surprised at the statements made. For his information and all others interested, I may state that the teachings of this institution comprise everything possible to teach. Dr. D. is perhaps not as well informed as he should be of the course of instruction pursued by the incumbent of the chair of operative dentistry. What are the facts? During the course *all modes* are taken up in proper order, going back to the earliest forms in which gold was prepared, to the latest; giving each their proper place and attention.

Cylinders are prepared before the class, and they instructed in the mode of filling the various cavities with them. So with other forms of soft foil. Because I conscientiously believe that one form is better than all others, am I to be debarred from giving that special pre-eminence? It would be unfaithfulness to the high trust imposed to take any other course.

Cylinder filling is, in my judgment, wrong in theory and worse in practice. It is no proof of the value of this mode that some fillings have lasted twenty years or more. I recently examined fillings placed in by my colleague Dr. Wildman, over thirty years ago, as good as when first inserted, but Dr. W. would hardly now assert that the mode then adopted saved as many teeth as the present plan of working. One who has been familiar with dentistry for twenty-five years or longer, and has gone through all the progressive steps taken in that time, must have a better judgment than those who have but recently entered the ranks. It is difficult for these to comprehend the difference between *true* soft non-cohesive foil and cohesive, or, as it is termed, adhesive foil.

I have not for some years advocated the use of adhesive foil in children's teeth, on the contrary have persistently advocated tin where a metal was required. It is very rare indeed that I have placed gold in the first permanent molars, and rarely will fill the permanent centrals and canines, at an early age, with anything more dense than Hill's stopping.

But, suppose adhesive foil was used? Which will require the greatest amount of pressure to condense, adhesive or non-adhesive foil? Certainly the latter. I am always thankful for criticism, believing it leads to a more thorough self-examination, and prevents a bigoted adherence to a certain routine of practice.

Dr. HUEY said: I would like to add my voice in favor of adhesive foil. I entered college from the office of an advocate of soft-non-adhesive foil, and who used it exclusively. I then thought this gentleman a splendid operator, but was converted to adhesive foil during my college career. I can make better adhesive foil fillings than I ever saw made with soft foil. Before the introduction of the rubber dam and other contrivances for keeping cavities dry, there might have been difficulty in its use, but not now.

Dr. W. H. TRUEMAN remarked: I think Dr. Darby has struck the right key. We do not, nor is it to be expected we should, all work alike; some attain success by one method and others by another entirely different. I have discarded the use of cohesive gold, because it is entirely too slow, and I see no prospect of practice making it any more rapid.

A student, with but few months practice, is able to compete successfully, both in time and quality, with those of many years experience. The system does not sufficiently reward persevering effort.

When commencing to use cylinders, it will require as much if not more time than pellets, but with practice comes expertness. In many cases, in the preparation of the gold and the operation of filling, the saving of time is immense, and the constrained positions, so often and so justly complained of, has to be endured only a few moments instead of hours.

It has been argued, they cannot be perfectly adapted to the walls of the cavity. It requires care, but is not at all difficult, much less impossible. With equal care and skill, the probability of weakness at this point, I think, far less with cylinders or their equivalents, than by any other methods. Theory and practice unite in proving this. A man who uses large blocks will build a wall much more rapidly than another who uses small ones, and his rapidity does not necessarily make his work imperfect. We are very apt to base our opinion too much on experience. We should remember experience is an expensive and crafty teacher; like a mule, well in harness, he pulls strong and pulls steady: slack the reins and he is full of capers.

Dr. BONWILL inquired, how long have you used adhesive gold?

Dr. TRUEMAN. Probably about twelve months; began to use cylinders slowly in easy cases. Still used gold cohesively in cases when I thought it best.

Dr. BONWILL. What is your experience in regard to the mallet?

Dr. TRUEMAN. I use it in very rare cases. In condensing crown fillings, when there is danger of the instrument slipping, I use a wooden one, weighing, perhaps, two ounces. In other cases I can make fillings more solid without it. I do not think teeth will stand continued pounding. It has injured teeth in the past, and will do it to-day. I am satisfied that the sharp, quick blow of the electric mallet will accomplish more, with less risk, than any other form of mallet I have examined. This judgment is based upon the construction and operation of the instrument. I have not tried it practically. Long experience is not absolutely required to enable or entitle one to an expression of an opinion. This, to be of value, must rest upon theory as well as experience; one without the other is almost worthless, and sure to lead into error. We can satisfy ourselves of many things by studying the science involved. We are not required to insert our hands in every fire we meet with to test its ability to burn. If we undertake to try everything we ahould very soon be burnt, and that quite badly.

Dr. BONWILL said: I had not expected to have taken part in this discussion; but when I found that individuals criticised the operations of others which they had not tested, I could not sit still.

Dr. Wm. Trueman asserts he has used adhesive foil occasionally for twelve months. Is he a competent judge of its merits? Neither can he be competent to place a valuation upon the merits of the malleting system, as it has not been used by him at all.

I was at the Niagara Falls Convention in 1859, when Dr. Atkinson first introduced his wooden mallet. It was derided. I used Abbey's old-fashioned non-adhesive gold until 1869, and was satisfied with the results. I could make it sufficiently cohesive to restore crowns, but used right angles, serrated points, and red heat. I was prejudiced against the hand-mallet, on the ground that nothing, in any respect, was gained; and had not health failed, rendering it necessary to resort to assistance from outside forces, would have still, no doubt, been at the "old hand-press." To meet the demand for labor-saving apparatus, I prosecuted the electric mallet from 1867, with which I can pack soft as well as adhesive foil. I believe in the quick, sharp stroke of the mallet, and the use of it wherever gold can be kept dry.

While I object to retaining pits as an exclusive rule, I have found them valuable adjuncts in many cases, making them the exception and not the rule. Have been in the practice of making them diverge from the pulp, or in a line parallel. When deep, and contiguous to the pulp, consider them as so many condensing thermal conductors.

In regard to the objection raised against the electric mallet, that the increase of solidity of gold gives rise to greater number of dead pulps, I can speak positively.

I have found, in three years, not more than three cases of periostitis after filling. These, when the fillings were removed, proved that the chambers were so nearly encroached upon, that any metal filling, soft or hard, would have produced similar results. This was the fault of sight, and not of the mallet. Though solid fillings are more sensitive to thermal changes, I have met with equal success with them. It is not true that the great number of quick, sharp blows of the electric mallet, ranging from 500 to 2,000 per minute, caused a greater amount of periostitis. No ordinary student of philosophy would, for a moment, consider it. The whole force is spent on the gold, and does not extend to the sockets, the movement of the point being but the one-fiftieth of an inch.

Dr. WM. TRUEMAN inquired: Do you use cylinders when applying your mallet?

Dr. BONWILL. No; not in the sense which Dr. T. advocates.

Question. Do you use cylinders to any extent?

Answer. No; I used rope when I first began in 1854; but only in that form for a year. I find cases where it is necessary, but always in shape of rope cut into sections, depending still upon the semi-cohesive qualities of soft foil knitted together.

My usual plan of introducing gold, is by holding the foil with an excavator, pointed or slightly grooved, or, in many cases, depending on a wedge forced up to the cervical wall, and left slightly above it, thus making an opposing wall to the floor, and forming a single cavity. The wedge, cut thus, keeps up the gum, and, at the same time, acts as a matrix, so far as holding the first piece of gold. This leaves more solid substance over the pulp. A solid filling, on the periphery, requires but little to hold it. The plans stated will give you retainers in all proximal cavities.

Dr. Wm. Trueman inquired: Will Dr. B. tell us the difference between adhesive foil and soft foil annealed?

Dr. Bonwill. I speak only of Abbey's soft foil, which, when carried to red heat, will not cohere, one piece to another, except under hard pressure or a blow. The so-called adhesive requires but to come in contact and cohesion results.

Dr. Jas. Truman then read a letter received by him from Dr. Abbott, of Berlin, which, as it discussed this subject very fully, he deemed appropriate. Dr. Abbott took strong ground in favor of soft foil, using but a small proportion of cohesive.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At a meeting of the association held September 10th, the following preamble and resolutions were adopted:

Whereas, At the meeting of the American Dental Association, held at Niagara Falls, commencing August 6th, 1872, the President held that delegates were not entitled to hold office; and, on an appeal being taken from said decision, it was confirmed by the association; and

Whereas, Article 3d, Section 3d of the Constitution expressly declares, "The members of this association shall be of two classes, delegates and permanent members, having equal rights and privileges;" therefore be it

Resolved, That the Pennsylvania Association of Dental Surgeons protests against such action as at variance with the original basis of organization, in violation of the Constitution, and an act of gross injustice to subordinate associations.

Resolved, That we would urge our sister associations to take such action, previous to the meeting of 1873, as will insure a reversal of said decision.

James Truman, *Secretary*.

Correspondence.

[We lay before our readers and the profession generally, the following letter of Dr. Bishop, the communication of Dr. Gunning to the American Dental Association, and the correspondence between Drs. Bogue and Gunning in relation to it. As a part of the history of the rubber question they are of importance, and as Dr. Gunning's paper to the American Dental Association failed to come up as part of the proceedings, it is due to him to give it general publicity. We believe Dr. Gunning to be thoroughly honest and deeply in earnest on this subject, but we are not prepared, at present, to give an opinion in the matter. We do not consider ourselves sufficiently well informed to advise in any direction.—Ed.]

14 East Twelfth st., New York, Sept. 24, 1872.

To the Editor of the Dental Times:

Sir:—I am tempted by the situation here to respond, in the interest of my profession, to a most important suggestion in your July editorial regarding the infamous Cummings patent.

You intimate that the dentists of Philadelphia, though they held aloof from the Gardner case, would be willing, you think, to take action in aid of a genuine and *bona fide* test case against the Cummings patent, where it was certain that the opposition could not be tampered with, and the whole case was above suspicion in every way. Now, if this be so, I write simply to say to them that this opportunity has come—a case so exactly what you describe as the thing needful, that it is a fit test of their willingness also to do real battle against the Cummings tyranny. Moreover, it is a case that has distinctly been offered to the control of the whole profession.

This offer comes from Thomas B. Gunning, of New York. *Three times* before he has been sued by the Cummings patent interest, and three times they have thought best, when they came to the fighting point, to retreat. Now, backed by the Gardner case, they have commenced a fourth attack, this time in earnest. Dr. Gunning is one of our first dentists, and has brought to the study of the Cummings patent an immense experience, a complete dental library, and the highest legal talent the country can afford; and he, as a dental expert, says, and he is advised by his counsel, that the Cummings patent can and will be beaten, Gardner case and all. This is the substance of what he states in offering his as a test case, through the American Dental Association, to the profession at large. This Association could not take up the offer at its meeting, if for no other reason, because it does not, and by its nature cannot, represent nor pledge the money power of the profession. Action in such a matter must emanate from the centres of dental business and influence; and as New York, Philadelphia, Boston, Baltimore go, so goes the country.

The question of the hour is: Can the profession rely on any one man to represent them unflinchingly, beyond every temptation and trick of the enemy, to the bitter end?

There are strong reasons for believing Dr. Gunning to be one who will do this. He is a man with recognized social position and professional eminence to lose and at stake upon his fidelity; a man already of independent fortune, and with as lucrative a practice as perhaps any dentist in America, and a man whose main characteristic is indomitable tenacity and pluck. Those that know him personally know that he can neither be bullied nor bought, and what he says he will adhere to through thick or thin.

Professionally he is well known to many of the leading dentists of your city; and they and Mr. S. S. White, who is well acquainted with him, can corroborate what I have said, and what, after many years acquaintance, is my own conviction.

If our brother dentists in Philadelphia are really in earnest against the Cummings patent, here is the chance they want. They will never, I sincerely think, get such another; and if, as you say, their former prudence has brought blame on them from any sources, they can now (though already amply justified by events), crush all cavil by some prompt action, if only in the way of intelligent inquiry in this matter. At least, after reading this, they will not act in ignorance. Yours, very truly,

J. ADAMS BISHOP.

TO THE AMERICAN DENTAL ASSOCIATION.

Desiring to relieve the dental profession from the oppressive and unjust demands of the Goodyear Dental Vulcanite Company, I submit through Dr. E. A. Bogue the following facts and propositions:

The Goodyear Dental Vulcanite Company has recently brought against me the fourth of a series of suits, which, in my judgment, are of general interest to the profession at this juncture.

The first suit against me was brought under the Cummings patent, by Josiah Bacon, in 1867. The dentists took no interest in this case; some were completely floored by the result of the suits in Boston and New York; others were looking forward to the event of the Goodyear suits then pending in Cincinnati, Chicago, and other places, which suits I felt assured would go against them.

I saw at once that if my case were not to stand, like Wetherbee's, a precedent against the profession, I must fight the matter through unaided, for I could not take the license offered to me, and leave the members of my profession to struggle under the disadvantage of one more submission to the Cummings patent, which I was certain was illegal and unjust.

Wherefore, in March, 1868, I put in my answer to Bacon's bill by George Gifford, Esq., as solicitor and one of my counsel. Shortly afterwards another bill was put in place of the first, in which the important amendment was made of joining the Goodyear Dental Vulcanite Company, with Bacon as a complainant. My answer to this second bill was filed in April, 1868, and the complainants put in their replication soon after, thus bringing the case to issue. The three months allowed for taking testimony passed without any action being taken by the complainants, nor did they ever after make a single move in the suit until May, 1872, just after the decision of the Gardner appeal, when they caused it to be absolutely withdrawn on the record.

Meantime, however, in April, 1871, they brought suit against me under the Nelson Goodyear patents, but withdrew this also about a month after its commencement. It will thus be seen that the Goodyear Dental Vulcanite Company have retreated from their attacks upon me three different times.

The Gardner appeal case was decided by the United States Supreme Court, May 6th, 1872. Fortified by this, Mr. Bacon and his company, after first withdrawing their old bill against me, as before stated, have lately begun a fresh suit in equity against me for infringement of the Cummings patent, which is now pending.

I now offer to make this a test case againt the Cummings patent, and to defend it in the interest and with the co-operation of the profession at large, until finally decided by the Supreme Court of the United States.

In thus doing, I think it a fair condition, that since I stand liable primarily in the suit, I should be assured by perfectly sufficient guarantees on the part of responsible individuals, that all the expenses of the suit, with any costs and damages incurred in the course of it, should be paid by them, they, in turn, making their own arrangements with the Association. On the other hand, to insure that the expenses should be found reasonable, beyond the chance of dispute, I should be willing to agree on all outlays before incurring them, with a committee, to be appointed by the Association.

I have studied this patent for years, with the aid of some of the best legal talent in the country, and I propose what I do under the full conviction that it has never been properly met, and that upon a fair hearing on its merits, it can and will be broken.

Should the Association make a test case against the Cummings patent it would greatly aid those who resist it. For their use the answer in the cases could be printed, and copies kept at suitable points throughout the country, in sufficient number to serve for all who should be attacked. District Associations could be formed, or competent solicitors retained by the Association in each district of the United States Courts, to defend all suits in such district. All the suits in each circuit could be probably consolidated, and practically all made dependent on the event of a test case, upon its appeal to the United States Supreme Court. By this means the entire profession, with a little organized effort, would obtain a virtual respite from the odious tyranny of the Cummings patent; and whenever that patent shall be tried honestly, and on its true merits, I have no doubt of the result.

In conclusion, I have only to say that I make this proposition in the fulfillment of what I believe to be my duty toward American dentists in general; and that, should it not meet with acceptance at their hands, I shall feel under no further obligation in the premises.

Thos. B. Gunning, 34 E. Twenty-First street.

NEW YORK, Sept. 26, 1872.

A note, as per copy below, came to my house during my absence from the city. It is, as you may see, dated after the adjournment of the American Dental Association, and is all that I have received in reference to the paper submitted by me; the paper was entrusted to Dr. Bogue, at the suggestion of a friend, I being myself but slightly acquainted with him:

29 East 20th Street, Aug. 13th, 1872.

MY DEAR SIR.—At the time I had the pleasure of seeing you at your house, on August 1st, you remember you requested me to present the subject of the suit against you to the American Dental Association, and used these words: "If the dentists will bear the expense, I will *smash* the Cummings patent."

I requested you to put your proposition in writing, that there might be no possibility of a mistake; this was done so late that I only received it as I was about to step on the train after the door was shut for passers.

On reading this document, I found an essentially modified proposition, and one that, I am free to confess, seemed to me far more prudent, *i. e.* in substance, "If the dentists would bear the expense, you would '*fight*' (or contest) the Cummings patent," and you added the opinion that you had no doubt of success.

I was unable to place the matter before the association personally, as I did not remain until the end of the session, at which time all business is transacted: but I put the papers in the hands of the secretary, and they were given to the committee on volunteer papers, since which time I have received no intelligence from them.

Unfortunately there was no signature to the paper containing the proposition, which, together with the other fact already mentioned, and the further fact that vulcanized plates, not of rubber, were exhibited at the meeting, will, I think, quite likely have prevented any action by the body as such.

As I undertook the mission, I feel that courtesy demands a report of my action, so I give it.

Regretting greatly that I was obliged to leave so early,

I am, yours, &c.

(Signed) E. A. BOGUE.

To Dr. T. B. GUNNING, 34 East 21st street.

I would say that I made the proposition in no quibbling spirit, but feeling that if accepted it would be of the greatest benefit, especially to those brethren in the profession whose moderate circumstances make it simply impossible for them, singly, to resist the Cummings Patent. It was with this motive that I studied the case thoroughly, and put in my answers in 1868.

I beg to say, also, that I feel, if possible, more than ever assured of the propriety, in fact the necessity of the action suggested by me, and this by what Dr. Bogue gives as a reason for my proposition being neglected by the Association, namely: the "further fact that vulcanized plates, not of rubber, were exhibited at the meeting."

Now, as I know nothing further of these plates, I cannot say whether they are or are not outside the Cummings Patent.

Of this, however, I am assured, that those who use them will be attacked by the Goodyear Dental Vulcanite Company.

I still believe that the only proper and safe way out of all this annoyance, expense and injustice is to break the Cummings Patent; this I am ready to do upon the terms proposed.

As my signature was left off the paper forwarded to the Association by mere inadvertency, I shall be pleased to have this letter attached to it, that it may form a part of the same. Very respectfully yours,

THOS. B. GUNNING, 34 East 21st Street.

Reviews and Book Notices.

The Pathology of the Teeth, with Special Reference to their Anatomy and Physiology. By Carl Wedl, M.D., Professor of Histology in the University of Vienna, &c. Translated from the German by W. E. Boardman, M.D. With notes by T. B. Hitchcock, M.D., D.M.D., Professor of Dental Pathology and Therapeutics in Harvard University, &c. With one hundred and five illustrations, pp. 470. Philadelphia, Lindsay & Blakiston, 1872.

This long and anxiously looked for work came into our hands too late for extended notice in this number. It is too important an addition to dental literature to be passed over carelessly, and we, therefore, prefer to defer a review until a thorough examination has been given it. From a cursory reading we are fully satisfied that whatever may be its defects, it meets a want long felt in our literature. While it may not give anything new on controverted points, it fulfills the aim of the writer in presenting his investigations in dental pathology in a form that all readers of dental literature may understand.

This work should be in the hands of every dentist in this country; and if it does not assist him materially in practical points, it will at least add to his scientific ability to perform them.

We anticipate a large sale. This it should have, not only to remunerate all concerned, but as an encouragement to still further add to our knowledge of the work done in other lands and other languages.

We congratulate the translator that he has been able to perform his laborious and most perplexing task with such signal success. The difficulties attendant on a translation are so many and so peculiarly trying, that only those who have experienced them can fully appreciate the self-devotion necessary for its reproduction.

The illustrations are superior, and the general appearance fully sustains the reputation of the publishers.

OBITUARY.

We are pained to learn, through the "*Corespondenz Blatt für Zahnärzte,*" that Dr. Adolph zur Nedden died at Nuremberg on July 1st. His death was sudden, he having been operating in the morning of the same day.

Dr. zur Nedden's place is one not easily filled. He was a leading spirit among the dentists of Germany. For some years he was editor of the "*Deutsche Vierteljahrsschrift für Zahnheilkunde.*" This position he filled with great credit and to the satisfaction of his professional brethren. He retired from the position about a year ago, being ably succeeded by Dr. Ed. Mühlreiter.

German dentistry owes much to Dr. zur Nedden for his labors in bringing the ideas of workers in foreign professional fields before the dentists of his native land. His translation of American and English works bear witness to his industry and enthusiasm in his profession.

Notwithstanding his intimacy with American work, he felt a large share of that prejudice peculiar to his countrymen towards American dental science, and repeatedly criticised the profession in this country in his journal. While we expressed at the time our belief that he was mistaken to a great degree in this estimate, we always entertained a profound respect for the man as an earnest and devoted laborer in his chosen field.

His knowledge of American and English professional work was very thorough and exact. In every number of the "*Deutsche Vierteljahrsschrift*" was to be found copious extracts from Association Reports as well as from all the journals. In addition to this, extended translations were made of more important articles. His example in this respect is worthy of imitation on this side. We cannot afford to isolate ourselves from the active minds of other lands; yet, until a comparatively recent period, the mass of readers knew very little of German dentistry.

Germany may have lost more scientific men than Adolph zur Nedden, but few whose departure will be more seriously felt in his profession.

Selections.

BIOLOGICAL AND MICROSCOPICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES, Monday, April 1, 1872.

Dr. J. Gibbons Hunt made an interesting verbal communication upon "The Preparation and Preservation of Tissues," in the course of which he remarked that he had of late quite discarded the use of glycerine and the terebinthinate media for mounting such objects, in favor of watery solutions of low specific gravity; and, as evidencing the superiority of aqueous fluids, exhibited a specimen of Aspergillus, which he maintained could only be seen as thus prepared; no gradual condensation of a heavier liquid, such as glycerine or balsam, being sufficient to answer the purpose. Dr. Hunt stated that any extremely delicate cell-walls are most clearly visible when mapped out by carmine or analine solution; and this staining, if done with care, may be accomplished without any other alteration of the tissue whatsoever. The green portion of plants cannot be satisfactorily preserved in alcoholic liquids, because spirit of wine dissolves chlorophyll, but the verdant hue may be admirably imitated by staining with a solution of indigo aniline, to which a few drops of tincture of picric acid have been added.

The speaker here exhibited a specimen of Sphagnum from Washington, mounted in balsam, which he said showed almost nothing, while a similar preparation, mounted in a watery solution, displayed every detail of its structure.

In regard to animal tissues, Dr. Hunt observed, that epithelial cells and sections of mucous membrane can hardly be seen at all when mounted in balsam, but when preserved in an aqueous fluid of low specific gravity, show to great advantage; and mentioned further, in reference to staining animal structure, that he had found that a neutral solution of carmine, prepared according to the formula of Rollett, enabled us to display, in muscle for example, not only nuclei but also well-defined cell-walls.

In conclusion, the doctor called the attention of members to an ingenious slide, invented by Mr. D. S. Holman, Actuary of the Franklin Institute, for exhibiting infusoria, especially under the gas microscope.

These slides, he remarked, are indispensable to the working microscopist. They are made by grinding a deep depression in a thick slide, and then making a very shallow circle all round the deeper central cavity. If the central depression be filled with the organism in water which we desire to study, and covered with a thin glass, in a short time the shallow circle, round the margin, will be filled with minute objects, often zoospores or other products in the life-history of the object in the deeper cell. The pressure of the atmosphere retains the cover in position.

Dr. Hunt also exhibited a very convenient lamp, attached to the board upon which his microscope stood, so as to allow of both being moved or even passed around a table together, without disturbing the perfection of illumination obtained for any particular object under examination.

Dr. James Tyson observed that he had had a good deal of experience in mounting animal tissues, and believed that the principle as enunciated by Dr. Hunt of preserving them in aqueous solutions of similar specific gravity to those which normally bathe their surfaces, was the true one. He had that very day found two of his valuable specimens, mounted a couple of years ago in the old-fashioned way, so deteriorated as to be almost worthless.

On invitation of the Director, Mr. Holman remarked that by means of his cell (as exhibited by Dr. Hunt) he had kept a vinegar eel locked up for six weeks in a small groove around a bubble of air; also, that he had found the minute infusoria always make their way very eagerly to the air-line, and will congregate around air-bubbles, where rotifers, for example, could be seen to break up apparently into multitudes of smaller organisms. This cell also possessed a great advantage in enabling us to keep a small animal alive even for five minutes while exhibiting it through the gas microscope, because the greater bulk of fluid it will contain requires a much longer time to become heated to a temperature fatal to the living organism under examination.

In reply to a question from Dr. Tyson, Mr. Holman stated that the slides now on the tables had been made according to his instructions by Mr. Weist, at a cost of $1.50 each.

Dr. Hunt suggested that the cost might be much diminished by omitting to polish the deeper concavity, which it was not at all necessary to have transparent.

Mr. Holman answered that it was in his opinion an important advantage to have both excavations polished, because otherwise it was difficult to keep the slide perfectly clean.

Dr. Isaac Norris remarked that polishing the deeper excavation was also useful on account of its enabling us to reverse the slide and examine, as occasion required, with a low power, organisms which had retreated to the bottom of the fluid.

Dr. Tyson inquired what cement could be depended upon to confine these watery solutions.

Mr. Wm. H. Walmsley observed that his new form of cement, made without any balsam, but composed of equal parts of gum damar and mastic dissolved in benzole, and thickened with white zinc ground in oil (not dry), did not leak, and was not liable to crack off the glass.

Dr. Hunt said that the damar cement was a useful one, but even with it the specimen must be mounted carefully or no satisfactory result could be attained.

Dr. Jos. G. Richardson remarked that some specimens of human red blood-corpuscles, which he had mounted more than six months ago in a saturated solution of acetate of potash, were still in a good state of preservation, and inquired of Dr. Hunt, whether, in his experience, this medium was not much more satisfactory than glycerine as a preservative agent.

Dr. Hunt admitted, in reply, that the acetate of potash solution was less objectionable than other dense fluids.

Dr. Tyson asked Dr. Hunt what steps he took to get rid of the excess of liquids around the margins of the cover.

Dr. Hunt answered that he had never been troubled with any difficulty of the kind suggested by Dr. Tyson, because, if a thin layer of cement was applied to the surface of the cell just before putting on the glass cover, a complete sealing up of the object in its preservative fluid was at once accomplished, and any superfluous liquid could be gently washed off by means of a camel's-hair brush dipped in water before the external cementing ring was laid on.

Dr. Tyson remarked that it was in regard to mounting specimens which practical hiscologists meet with in ordinary examinations and cannot easily transfer to previously prepared cells that he was anxious to obtain information.

Mr. Walmsley suggested that just as there was no royal road to the hill of learning, so there was no presidential path to the mounting of specimens, and that the only way to gain success was by learning to perform carefully and thoroughly each step of the process.

Dr. Tyson inquired of Dr. Hunt whether he had ever been able to preserve specimens in solution of acetate of potash without the use of cells.

Dr. Hunt said he was not sure that either glycerine or solution of acetate of potash would allow permanent mounting except by employing a carefully prepared cell. He was desirous, however, that other members who had not yet spoken, should give their experience, and begged leave to request the chair to call upon Dr. McQuillen for a contribution to the general fund of information.

Dr. J. H. McQuillen remarked that his observations accorded in the main with those of Dr. Hunt, except that he was inclined to endorse in part the high estimate Dr. Lionel S. Beale placed upon glycerine as a preservative medium. When used in well-arranged cells he had found no such difficulty as that referred to by Dr. Tyson; some of his specimens of trichina spiralis, for example, remaining in perfect order for over two years.

Dr. Tyson observed that the difficulty he had met with was in manipulating thin tissues requiring compression, and those also which were of too great tenuity to admit the use of a cell when examined with high powers.

Dr. Hunt stated that he had in his collection a specimen of tessellated epithelium, which, although mounted in a cell, could be well shown with a one-twentieth inch objective, giving, with the deep eye-piece, a power of 2,000 diameters.

Dr. Richardson said that for examination with high powers (one-twenty-fifth and one-fiftieth) he had been accustomed to mount specimens in glycerine or acetate of potash solution without the employment of cells, by applying, in the usual mode, a small drop of the preservative fluid at the right and left lateral borders of the cover, and at once dotting the upper and lower margins of the same with zinc-white cement, so as to fix it securely in position; then, after twenty-four hours, when the solution had completely penetrated beneath the thin glass, there was no difficulty in wiping off the excess of liquid with a cloth slightly moistened in water, and afterwards securing the whole by a ring of cement, thrown around it upon a turn-table, in the ordinary way.

In reply to a question from the Chair, Mr. Walmsley stated that Bell's cement was reported to be composed of gum shellac dissolved in absolute alcohol, and colored with dragon's blood.

Dr. Hunt remarked that he had not been able to succeed in preparing a good cement by this formula, and that another member of the section, Mr. Charles Bullock, had tried many experiments in regard to dissolving shellac in alcohol, without satisfactory result.

Dr. Tyson observed that he had found ether useful for thinning Bell's cement, and mentioned that he had been so well pleased with this cement that he had of late employed it exclusively in his preparations.

Dr. McQuillen asked if Dr. Hunt had mounted sections of bone or teeth in anything but balsam and glycerine, both of which gave, he thought, such erroneous ideas of the lacunæ..

Dr. Hunt replied that he quite agreed with Dr. McQuillen as to the unsatisfactory nature of these menstrua for mounting sections of these structures, since in them the lacunæ of the former became almost invisible to ordinary research, and could only be brought fairly into view by a trick of illumination. He believed his plan of using watery solutions of low specific gravity gave much better results.

Dr. W. S. W. Ruschenberger inquired whether any of the members present had experimented upon the mounting of blood-corpuscles in a solution of hypophosphate of soda; and, in reply to a question from Dr. Hunt, said that he believed Dr. Paul Goddard, who first suggested the method to him, was accustomed to use a solution of about the specific gravity of normal blood serum.

Dr. Hunt remarked that he thought we should be very cautious about drawing deductions from the aspect of animal tissues as ordinarily examined, since the fact is we know nothing whatever about life and living processes, and that all our so called histological investigations are really pathological ones.

Dr. Tyson observed the circumstance, for example, that a corpuscle, as seen circulating in the web of a frog's foot, was so similar in its visible characters to those examined after they had been drawn upon a slide, that he could not think any marked alteration took place soon after leaving the vessels.

Dr. Richardson mentioned that a statement appeared some months since in several of the medical journals to the effect that the nucleus in the frog's red blood-corpuscle was a post-mortem change; and asked Dr. Tyson whether he had ever noticed such an appearance in red disks which were still within the capillaries of the animal.

Dr. Tyson said that although he believed nuclei were visible under such circumstances, yet he could not distinctly recollect having seen one in a circulating red blood-corpuscle; and, indeed, had been struck with the frequent absence of nuclei in the corpuscles of freshly-drawn frog's blood.—*Medical Times.*

INFLUENCE OF MEDICINES ON LARVÆ AND ANIMALCULÆ IN STANDING WATER.

BY P. J. FARNSWORTH, M. D., OF CLINTON, IOWA.

Some time in August last, having occasion to use rain-water, I procured some from a barrel standing at the corner of the house. It had been standing there for a few days, and I at once observed that it was literally crowded with animal life. The musquito larvæ and those of the gnat, and all the curious creeping, flying, swimming creatures that inhabit standing-water during the summer were revealed by a glass of moderate power.

It occurred to me to try medicines on the inhabitants of the teeming world, and watch the physiological effects. I poured into each of a row of goblets four fluid ounces of the water. To the first I added two grains of carbolic acid in solution. In five minutes every animal and animalculæ was dead. Into the next glass I put one-half grain of carbolic acid in solution. All were dead at the end of an hour.

Into the third glass were put two drops of chloroform. In two minutes every form of life was still, and on agitating the water the undissolved globules of chloroform caught up a large number of the dead forms, and rolled them up with itself. The minute forms of life, especially the microscopic ones, were all killed in less than a minute, when one drop of chloroform was added. Some of the larger forms remained at the top of the water, and did not seem to be affected with so small a quantity. Putting a gallon of water into a glass jar, I poured into it a drachm of choloform, stirring the water with a spatula. Before the motion of the water had ceased most of the lesser forms were dead, and were gathered into the globules of chloroform that were rolling at the bottom. Some of the larger larvæ lived for a little time at the top of the water, but in a little time they sunk to the bottom dead, and at the end of thirty minutes only one or two of the largest were alive, and no life could be discovered elsewhere with the naked eye or by the magnifying glass.

Into another glass was put sulphuric ether—at first a few drops, which seemed to have little effect; but when half a drachm was added the larger forms died very soon, but the more minute lived for two hours. Into the next glass was put a drachm of Fowler's solution (*liq. potas. arsen.*). At the end of an hour most of the smaller animalculæ were dead, but the larger forms were alive at the end of two hours.

A solution of morphine sulph., five grains, was put into another glass, and none seemed affected by it at the end of three hours. Into another glass was put a strong solution of common salt. The larger larvæ seemed affected by it in a short time, but many of the minute forms were alive at the end of three hours.

A solution of tr. iod. co., twenty drops, destroyed all appearance of life in three hours. A solution of soda sulphite destroyed the inhabitants of one glass in two hours. Ten drops of sulphuric acid seemed to have little effect on them. A large amount of alcohol only seemed to increase their activity. I repeated the experiment with chloroform several times with the same uniform result. I did not have another opportunity to repeat the experiment during the fall.

The most remarkable effect was produced by the chloroform and carbolic acid. It suggested itself to me that for certain purposes water might be purified in small quantities with either of these substances. The addition of a small portion of chloroform would not injure water for many purposes; the chloroform would remain at the bottom of the vessel, and the rest might be filtered for use. The small amount of carbolic acid would not injure the water for many purposes, and it might be put into standing water to prevent its becoming populated. In any light, the experiments were interesting, and I hope to repeat them on some future occasion.—*Med. and Surg. Reporter.*

NEW METHOD OF NICKEL-PLATING.

Within the last few years a process of nickel-plating by electrolysis has been invented by Mr. Isaac Adams, of Boston, and is now employed to a considerable extent in all of our large cities. Mr. Adams' process, which is patented, involves the employment of a bath of double sulphate of nickel and ammonium and of an anode of cast nickel. The prices charged by companies working under the patent are extremely exorbitant, and, as a coating of nickel is an excellent preventive against rust and injury by acid vapor, chemists will give a hearty welcome to a simple and cheap method of nickel-plating, which is open to the use of all. The process, which is due to Prof. F. Stolba, is as follows:—The salt of nickel may be the chloride, sulphate or double sulphate of nickel and potassium. It need not be chemically pure, but must contain no metals which are precipitated by zinc. In addition, the operator will require a solution of chloride of zinc, obtained by dissolving commercial zinc in common chlorhydric acid, cuttings of sheet zinc, zinc-dust, and pure chlorhydric acid. The process of plating may be effected in a vessel of porcelain of metal; the author prefers copper, which itself becomes plated with nickel. The articles to be plated may be of cast or wrought iron, steel, copper, brass, zinc or lead. They must be completely immersed in the liquid used for plating, and their surfaces must be perfectly free from fat and rust. Iron vessels may be cleaned by treating with a solution containing 3 or 4 per cent. of chlorhydric acid. A sufficient quantity of concentrated solution of chloride of zinc is now poured into the plating vessel, and from once to twice its volume of water added. The solution is then to be heated to the boiling point, and the chlorhydric acid added drop by drop until the precipitate, formed by diluting the chloride of zinc with water, is redissolved. As much zinc-powder as will cover the point of a knife is then added, by which the metal of the vessel becomes, in a few minutes, plated with zinc wherever it is in contact with this liquid. Enough nickel salt is then to be introduced to color the liquid distinctly green, after which the articles to be plated, and with them some small cuttings of zinc, are to be put in, care being taken to afford a sufficient number of points of contact. The liquid is then to be boiled, when the nickel is soon precipitated, and the work is finished in about 15 minutes. If particular parts of the articles are not plated, the boiling must be continued, fresh pieces of zinc, and, if necessary, fresh nickel salt, being added. It is important, if the coating of nickel is to be brilliant, that the liquid on boiling shall not be cloudy from basic zinc salt, or acid from free chlorhydric acid. The nickel-plated articles must be well washed with water, and then cleansed with polishing chalk. The author found that articles of copper, plated with nickel, after several months' exposure to the atmosphere of the laboratory, appeared scarcely tarnished. It is important to remark that the same liquid may be employed repeatedly for nickel-plating, especially where chloride of nickel is employed. The same process applies to cobalt, but the coating with this metal, besides its cost, possesses no practical value.—*Polytechnisches Journal,* cci., p. 145, July, 1871.

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DENTAL TIMES.

VOL. X. PHILADELPHIA, JANUARY, 1873. No. 3.

Original Communications.

SECTIONS AND SECTIONAL FILLING.*

[From an Essay read at the Fourth Annual Reunion of the Dental Societies of the Seventh and Eighth Judicial Districts of the State of New York.]

BY J. EDWARD LINE, D. D. S.

* * * What are we to understand by the term "section?" What is a "sectional filling?" We understand a "section" to be "a part separated from the rest; a portion, a division" that retains, more or less perfectly, its individuality, no matter to what treatment it may be subjected. * * * That a "sectional filling" be such in fact, it must, when broken up, resolve itself into as many parts or portions as entered originally into its construction.

The manufacture of sections calls for the assistance of but little apparatus. The essentials are a block, several steel rods, a number of broaches, a case-knife, and a good article of non-cohesive gold foil. These, in skillful fingers, cannot fail to turn out sections of whatever kind.

The block should be of wood, six or eight inches square, and from one to one and a half inches thick. It should be covered with chamois, velvet, or blotting paper, tightly drawn over the upper surface, and fastened, by means of tacks or glue, to the sides. Two or three sides of the block may be furnished with raised edges to prevent loss of gold in moving about the table. These edges may be made to substitute the tacks or glue, and are, on the whole, preferable.

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*Most readers will notice that the subject-matter is such as is usually considered under the heading "cylinders and cylinder filling," or "blocks and block filling." Reasons for change of terms have been given elsewhere.

The rods should be of steel, number not less than five, and be regularly graded in size from $\frac{1}{32}$ to $\frac{1}{8}$, perhaps to $\frac{3}{16}$ of an inch in diameter, the surfaces highly polished and the ends well rounded. The surfaces may be kept perfectly bright by the occasional use of emery cloth or paper.

The broaches should be of steel of the finest quality, number about half a dozen, be regularly graded in diameter from the finest cambric needle to $\frac{1}{16}$, in some cases to $\frac{1}{8}$ of an inch, and present four or five plain surfaces; that is, be square or pentagonal. The latter are adapted to the manufacture of sections of large size; the former to sections of very small dimensions. The rods are known as watchmaker's steel, and, with the broaches, can be procured of dealers in watch findings.

To make a section for a given case, it is necessary first to determine the depth of the cavity to be filled, then to select a rod the diameter of which is not less than $\frac{2}{3}$ of the depth of the cavity. A sheet of non-cohesive foil is placed on the chamois or other covered block, and the selected rod on this, the sheet parallel, or nearly so, to one of its margins.

The rod is now rolled to or from the person, as convenience may dictate, and the foil gathered smoothly and closely upon it. The rod is next taken between the thumb and index finger of the right hand, the coiled foil between like digits of the left, and both drawn in opposite directions, thus removing the foil. The latter, which is now in the form of a cylindrical sheath, is made flat or ribbon-like, by means of the fingers or the case-knife.

The next step consists in laying the flattened foil along the index finger of the left hand, and coiling it as smoothly as possible and as closely as necessary, upon a broach rotated by the fingers of the right. The ends of the now cylindrical section are reduced to regularity between a pair of spring pliers, and the sides compressed between the fingers. This lateral compression—the object of which is two-fold, first, to reduce the section to a more desirable form, and secondly, to veto its tendency to uncoil—is limited by the size of the broach on which the ribbon is coiled, and also by the number and closeness of the concentric layers that enter into its—the section's—construction.

Sections may be considered under four heads,—form, length, diameter and consistency.

Form.—The forms of sections are numerous, the more important being the cylindrical, the oval and the flat. The manner of making the cylindrical has been detailed. The oval is made by subjecting the cylindrical to the pressure of the thumb and finger, or the case-knife. If it is desired that the oval be little less than cylindrical, the broach must be but little larger than that used for the true cylinder. If, on the other hand, it is desired that the section be nearer flat than otherwise, the broach must be of greater diameter. This may be briefly put thus: the smaller the broach the nearer cylindrical the section; and oppositely, the larger the broach the nearer flat the section. The flat section is now known as the "mat," and under its new name is looked upon as something recent; whereas it was common property long anterior to the introduction of cohesive foil.

Length.—The length of sections is limited only by the necessities of the case in hand. As a rule, deep cavities call for the use of long sections; shallow cavities for short ones. Cavities of great depth can sometimes be filled to advantage with two or more tiers or layers of sections, one above the other, each layer being introduced and finished as a separate filling. It will be remembered that the length of a section is directly proportionate to the diameter of the rod on which the foil is coiled.

Diameter.—The diameter of a section is determined by the size of the broach, the length and thickness of the ribbon of foil, and the manner of coiling. These points are so obvious that more than the mere mention of them is uncalled for. The diameter may all but equal that of the cavity to be filled, or it may not exceed that of a fine cambric needle.

It is often desirable, sometimes necessary, to make sections the diameter of which shall be great in proportion to their length. To do this, the form of the sheet must be changed from square to oblong. This done, place the selected rod parallel with the long axis of the sheet, and roll as before described.

Consistency.—Sections may be made as hard as gold wire itself, or their density may not exceed that of a loosely-rolled soft-foil pellet. The hard, wire-like kind, are made by coiling a thin ribbon of foil smoothly and closely on the finest broach, while those of a soft and yielding character are made by coiling smoothly, but loosely, on a broach of whatever size.

With respect to their accessibility for the purpose of filling, cavities may be conveniently classified as follows:

Class 1.—Crown surfaces of molars and bicuspids.
Basilar surfaces of incisors and canines.

Class 2.—Buccal and lingual surfaces of molars and bicuspids.
Labial surfaces of incisors and canines.

Class 3.—Mesial surfaces of molars and bicuspids.

Class 4.—Mesial and distal surfaces of incisors and canines.

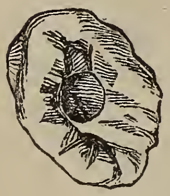
Class 5.—Distal surfaces of molars and bicuspids.

All efforts on the part of the writer to render this classification more accurate, and at the same time preserve its simplicity, have signally failed. Each of these classes might, for the sake of accuracy, be subjected to subdivision; but the process, so far as our object is concerned, would terminate only in unnecessary complication.

Taking this classification as a basis, it will be most convenient to pass from the consideration of the most simple of cavities to that of the most complex. The question which first suggests itself is that of preparation. How shall the cavity which it is proposed to fill be prepared? What shall be its shape for the reception and retention of a sectional filling?

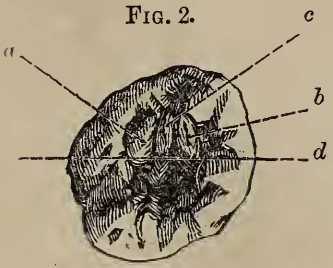
Class 1.—Evidently the most difficult of cavities of this class occur in the third superior molar. They are naturally divided into simple and complex. Fig. 1 illustrates a cavity of the simple kind, and which, perhaps, is more common than the complex in the teeth under consideration. To prepare this for a sectional filling, two instruments only are necessary, the cylindrical bur drill and enamel knife or chisel.

Fig. 1.



When these have been properly manipulated, the cavity will present strong walls, perpendicular, or nearly so, to the surface on which it opens. To fill this according to the sectional plan, place an oval section in the most distant part, and at one side, as at Fig. 2, (*a;*) another on the opposite side, as at (*b;*) then a firm flat one, as at (*c.*) Place upon these a broad foot plugger, and push or drive them as far as possible, with safety to the tooth and a due regard for the patient's nerves. The line marked (*d*) indicates about the place to which the mass must be forced to insure solidity. Upon examination, this portion of the filling will be found capable of resisting any amount of force applied to subsequently introduced sections. The next tier, and the next, are treated in exactly the same manner. When the cavity has been all but filled, a point of great interest will present itself, namely, the insertion of the fixing or key-section.

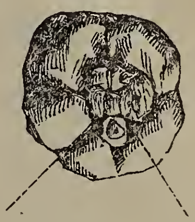
Fig. 2.



The majority of those not fully acquainted with the sectional method, place this section in the cavity last, which is proper, and against the wall, which is not. This practice has proved in many cases fatal to both filling and tooth. How? You will recollect that the key-section is of a wire-like consistency; in fact, is better made of gold wire than of foil.

If this be inserted next the wall, there will remain two triangular openings, one on each side of the key. These openings cannot possibly be closed with gold, and if left unfilled, the not far-off results will be the undermining of the filling and the destruction of the tooth. Fig. 3 illustrates this condition.

FIG. 3.



Where, then, shall the key-section be inserted? When, as before stated, the cavity has been all but filled, it will appear as in Fig. 4, *minus* the lettered parts.

There yet remains room for two sections besides the key. One of these should be placed against the wall, as at (*a*,) the other as at (*b*,) and a smooth plugger or burnisher forced between them and the already consolidated portion of the filling. We now have a gold cavity, highly polished, in which to insert the key. This is made to fit tightly, inserted, and the whole surface worked down with a square-ended plugger and burnisher.

FIG. 4.

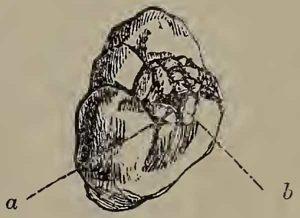
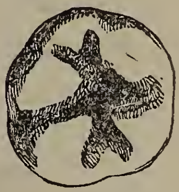


Fig. 5 illustrates a cavity of the complex kind of Class 1. It consists of a central cavity and fissures that radiate therefrom. The preparation of this cavity calls for the use of but two instruments, the chisel-drill and enamel-knife. In practice it is common to open up the centre first, and afterwards the fissure. We have found it more convenient to begin the preparation of the cavity by regularly drilling the outer ends of the fissures first, afterward the centre.

FIG. 5.



If we have the walls of this cavity perpendicular, or nearly so, to the grinding surface, we are ready to introduce the gold. Convenience will dictate at what point to begin. Generally the most distant part will prove most favorable, and that part the end of a fissure. The process of filling may be made to terminate in the centre or in a fissure. If in the centre, proceed as in a simple cavity; if in a fissure, be sure to place a section in the outer end before the insertion of the key.

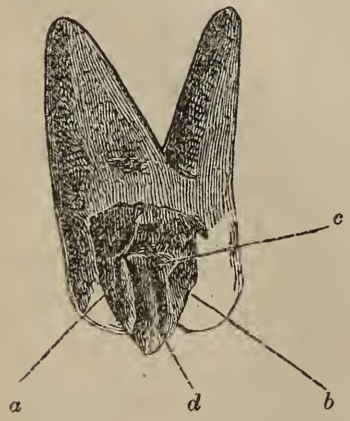
Class 2.—Perhaps the most difficult cavity of those enumerated under this head is found to open on the buccal surface of the third superior molar. It crosses the tooth horizontal to, and at or near the margin of the gum. The bur-drill, and hoe and hatchet excavators will be found all sufficient to render cavities of this class ready for filling. The details of the operation are similar to those mentioned in relation to the filling of fissures. The point of all others not to be overlooked is the insertion of the end section before the key.

Class 3.—Cavities of this class, if simple, are filled after the same manner as that prescribed for simple cavities of Class 1; if compound, other treatment must be resorted to. Compound cavities involve loss of tooth substance from two or more surfaces, generally but two. For illustration, let us take a cavity in the mesial surface—or mesial and grinding surfaces, if both be involved—of the third superior molar. If the cavity open only on the mesial surface, all that tissue between it and the grinding surface must be broken out. This is easily done by means of the enamel chisel and mallet. If both mesial and grinding surfaces have been removed by decay, so much the better. In either case the walls should bevel from without inwards, and from below upwards.

In cavities in which the removal of crown tissue is slight, and in front of which there is plenty of room, the filling can be made as well exclusively of sections as if the wall were continuous. If the removal of crown tissue be more than slight, it will be found difficult, if not impossible, to fill exclusively with sections, and feel that the work is of a permanent character. In most cases the destruction of much tissue is unavoidable, and then we must resort necessarily to the use of cohesive gold to fill from one-half to one-third of the lower or crown portion.

The filling of the narrow-mouthed cavities of this class involves at least one point of great interest, and that is the closure of the crown opening. Begin by placing a tier of sections at the cervical wall, then one below this, and so on until nearly filled. At this step in the process place an oval or flat section on one side, as at Fig 6, (*a*,) another as at (*b*,) and press or drive home so as to leave the triangular opening, (*c*.) Place in this a wedge-shaped section, the edge downwards, and force to the position marked (*d*.) Lastly, insert the key in (*c*,) and work down after the usual manner. To do a piece of work of this kind, and do it well, calls for skill of no mean kind, also for a little more time than the use of

Fig. 6.



cohesive gold would involve. It is more practical to fill the lettered parts with the latter preparation.

Class 4.—Cavities of this class, when surrounded by a continuous wall of considerable strength, are filled exclusively with sections. The greatest difficulty met with here is want of room between the teeth to permit the free use of pluggers. Separation by any good method may be made, and in addition the mesio and disto-lingual angles should be removed—*a la* Arthur—for the triple purpose of making them self-cleansing, affording ample room for manipulation, and obtaining thick and proportionally strong marginal walls. Fill as described for simple cavities of Class 1.

If the condition of things be such that sections alone cannot be used, we must take to cohesive gold. Where this is necessary to the completion of a filling, the great retainer is to be found at the cervical wall. This should be deeply grooved and filled to the level with Morgan's plastic gold, care being taken not to let this preparation project from the cavity. Small oval sections should now be introduced until the cavity is from one-half to two-thirds filled, and then the use of cohesive foil begun. These sections may be slightly annealed, for convenience sake, that they may cohere to the plastic gold, and furnish a sticky foundation for the, to be added, cohesive. The principle involved in this last clause should not alone be depended upon; the shape of the unfinished portion of the cavity should be self-retentive.

Class 5.—This class includes all cavities that occur on the distal surfaces of bicuspids and molars. Their treatment is similar to that of cavities of Class 3, with this difference, that they will have to be opened invariably from the crown. The sacrifice of so much tissue is to be deplored, and in a few cases—the bicuspids—can perhaps be avoided; but between the evils of such sacrifice, and doing a piece of work that must of necessity fail, the preference is freely given the former. Jack's matrices play an important part in the operation of filling these cavities. Insert one between the tooth to be filled and the one posterior to it, the polished surface toward the cavity, and we have a difficult operation made exceedingly simple. As regards the third molar, if the matrix is used at all, it must be clasped by means of wire or a rubber plate to the tooth or teeth anterior to it. This method of applying the matrix was given in "difficult cases" by Dr. Louis Jack himself; at least such is my recollection.

This, gentlemen, is a brief statement of "sections and sectional filling" as now practiced. When we take into consideration what has been done, and is now doing in this direction, we cannot but be gratified with the prospect. What in time past was looked upon as fogyism, promises soon to be one of the operative dentist's best passports into respectable dental circles.

TESTIMONY IN FAVOR OF DR. ARTHUR'S METHOD.

BY THEODORE F. CHUPEIN, D. D. S.

During the late war between the States I was sent for by the General commanding the troops, where my company was stationed and doing garrison duty, to render him the service of filling a tooth. I had never thought of taking my dental instruments into camp, but after this request from the General, (which gave me a short furlough, a respite all soldiers were glad to obtain,) to have me operate for him, I kept my instrument case in camp, and operated to a considerable extent for the officers and men in the various companies and regiments stationed around.

The question of filling teeth with gold foil was one of no little pecuniary outlay, even in "Confederate money," for at the time of which I write I paid "*twelve hundred dollars* for *an ounce of gold foil*," bought at Atlanta, Georgia. I was, therefore, constrained to use tin foil to a considerable extent, and even when this got low and was giving out, to use the chisel and the file, the latter being very often so dull from continual use, notwithstanding frequent sharpenings with the aid of sulphuric acid, that considerable time and torture was used to effect the operation. All cases, therefore, of superficial decay, wherever situated, were consigned to the tender mercies of the file and chisel; for men were ever then on the move, and "*we could not wait for cavities to get larger.*" Being in an artillery company I had the advantage of the portable forge, wherein I could renew my tools. This, at least, kept my chisels in order, if it lent me no aid with my files. I have within the last month seen cases I had treated *nine years ago*, of superficial caries removed on the buccal and masticating surfaces of the molars with the chisel, and on the proximate surfaces of other teeth with the file, in the most perfect state of preservation, looking as white and beautiful as if they had never been touched by decay.

I had always been taught in operating on the front upper teeth first to separate them, and, when well separated, to start the file well under, so as to remove a good portion of the palatine and proximate surface, thus securing a self-cleansing space when the teeth came together again. All the teeth that I treated in this way, in the army, which have come under my observation, exhibit a perfect freedom from decay. I do not know if I can call this "testimony in favor of Dr. Arthur's method," for, as I understand, his consists of the use of the chisel alone on the proximate surfaces of all teeth, so as to secure self-cleansing spaces; but if the operation be performed with a chisel or file, and the result be the same, the testimony as to the efficiency of such separations holds good.

CHARLESTON, S. C.

ABNORMAL DENTITION AND RESULTS.*

BY JAMES TRUMAN, D. D. S.

[Read at the re-union of the Seventh and Eighth Districts Dental Societies, held at Rochester, N. Y., October 29th and 30th, 1872.]

In complying with the earnest request of my friend, Dr. Line, to write a paper for your Association, I feel embarrassed by the thought of the difficulty of selecting a subject that will at once interest and instruct. The one chosen is, undoubtedly, familiar to all, and with the desire to promote discussion, more than anything else, I have selected to give you a few thoughts on "abnormal dentition and results."

If we extend our observation over the field of dental practice, we observe here and there growths that have departed from the regular process of development, and have assumed forms, to a greater or less extent, that properly class them with anomalies in dentition. Amongst these we find "supernumerary teeth"—abnormal development of the regular series—the malposition of the *dentes sapientiæ.*

Taking them up for consideration in the order named, I will first ask your attention to the peculiar presentation known as "supernumerary teeth." This title is a misnomer, if we apply it to all supplemental growths, and in this manner it is generally applied.

Supernumerary teeth, as generally understood, must be sub-divided under two heads—"supernumerary" proper, and "supplemental." This division was first made by Tomes, who saw the obvious error of classing the two forms together—the one being irregular in form, the other entirely normal in general character.

Now, what do we understand by the term supplemental tooth? It is a tooth found in the series, differing in no respect from the other teeth in the mouth. It will usually be developed regularly. In fact, irregularity with this class of teeth has been the exception in my observations. They are, essentially, *twin* teeth, developed at the same period, presenting nothing abnormal, except that they increase the number beyond thirty-two. We find this extra development as far posteriorly as the molar teeth, but they will generally present themselves in the anterior, adjoining the laterals and canines; hence, double laterals and canines are not uncommon, and yet sufficiently rare to have, perhaps, escaped the observation of many in long practice. The Clinic of the Pennsylvania College of Dental Surgery has furnished many and interesting examples of both classes of teeth, and, from observations made on these, the conclusion has been arrived at that these teeth are peculiar to persons of large vitality, insuring very perfect development, not only of the dental, but all the tissues of the body. To ordinary observation these teeth present no irregularity; they are perfect in their place. If we have two laterals they are equally well formed. If two canines, one may not be as sharply pronounced as the other, but still a canine. If a bicuspid, it is a perfect bicuspid. Four laterals are more rare, but specimens in my possession show that this extra development may extend at the same period to both sides of the mouth. We know nothing of the cause of this extraordinary increase of the series, any more than we know how to explain many problems in nature. I think this development is more rare in the lower than upper jaw. Mr. Tomes mentions several cases of five inferior incisors. In one case I met with three canines. It is hardly necessary to do more than to draw attention to the fact that distinction must be made between these exhibitions, and the presentation or rather the retention of the deciduous teeth in the series, long after the balance of that series had been thrown from the mouth.

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*The subject of this paper having been chosen for the writer, he found it necessary to embody in the forepart the principal portion of a paper prepared by himself, and published in No. 2, Vol. I, of this journal.—Ed.

As no irregularity is produced by this development of the supplemental, it necessarily follows that remedial treatment is unnecessary.

The next in order, in the sub-division, is the supernumerary proper. These, like the supplemental, are *generally* found in the anterior part of the mouth; but there are exceptions to the rule. That their presentation, posterior to the incisors, has often given rise to the fable of a double row of teeth I have no doubt. The difficulty in determining the character of these presentations has frequently perplexed not only the beginner but even those long years in practice. Recognizing no known law of development, they appear in situations so out of the usual order as to render it difficult to decide as to the best course to pursue. At the risk of being thought elementary, I must give a general outline of their peculiarities, as, perhaps, some present may not be as familiar with them as those long in practice. To render this description clear is not an easy task without proper diagrams. Indeed, any description will fail to give a correct idea of all the forms that they assume. As an instance of this, a case presented for treatment at the clinic of the Pennsylvania College that at first view appeared to be two supplemental teeth entering the mouth posteriorly to the central incisors. While they remained in place it was difficult to determine their true character, being deeply imbedded in the mucous tissue of the hard palate, their forms being so nearly allied, one to the lateral and the other to the cuspidate, that they could readily have been mistaken for supplemental teeth. Upon extraction they presented the unmistakable characteristics of the supernumerary, but also exhibited some anomalies, in general appearance, worthy of notice.

One was really a double lateral, if I may use the term, connected posteriorly, so that in turning round it presented a very fair imitation of a lateral incisor for either side of the arch. The other was not so marked in its resemblance, but still so nearly presented the well-known outlines of a cuspidate as to have been mistaken for one. This also had the double appearance, but not so perfect as its fellow.

In another case coming under observation, the tooth presented the general character of a lateral incisor with an imperfectly formed cusp posteriorly, but the general inclination to the cone shape; a marked characteristic of all this class of teeth is preserved in this specimen. Another might readily be mistaken for a bicuspid, having three small cusps, crown irregular in shape, but in general configuration similar to that class. In a case where they presented alongside of the wisdom teeth, one bore a near resemblance to a miniature dens sapientiæ and the other had the general form of a bicuspid. But it would uselessly prolong this paper to give detailed descriptions of all that have presented. No two that I have met with are exactly alike, but, like all other abnormal creations, they seem to be out of the pale of law, making their appearance without much regard to time or place. But notwithstanding this erratic character, they have peculiar features that invariably are present.

I have remarked that they generally are present in the anterior part of the mouth. They are not confined to this location, however. They may present themselves between the teeth, causing disagreeable deformity. They may enter the mouth below the other teeth. An illustration of this presented in a patient where a portion of a supernumerary protruded on the lingual surface of the inferior jaw below the first bicuspid; and in the same mouth another on the lingual surface near the apex of the inferior lateral incisor. I have never met with one adjoining the bicuspids or first and second molars, but it is by no means uncommon to see them alongside of the wisdom teeth. They sometimes present in a position that may involve trouble to the practitioner, and that is where union has taken place in the process of development, and the supernumerary has become united to the regular and permanent tooth. Extraction, under these circumstances, would necessarily involve the destruction of a good tooth. Care should, therefore, be exercised to examine cautiously with a probe before attempting removal, to see that no union had taken place. These forms very frequently present well up on the hard palate. The idea naturally occurs to some minds that extraction there may result in leaving an opening through the palatine bone. To the properly instructed this fear is groundless, as it is well known each tooth, whether normal or abnormal, must be developed in a bony investment of its own, and extraction from this simply leaves a closed socket, which in time becomes either absorbed or filled up with new depositions of bone.

The question arises, how are we to know these teeth, and determine their true character?

Their most prominent characteristic is the before-mentioned tendency to develop into the cone shape. This is the most striking feature, and will enable any one to immediately detect their true character.

Second. Their irregular shape, resembling nothing exactly in the whole normal teeth.

Third. The enamel line at the junction with the root is clearly marked, forming an abrupt edge. This is not the case with permanent teeth of the normal set, and would class them more directly with the deciduous, though only in this particular, for they bear no resemblance in any other respect.

Fourth. Their very short, stumpy roots. This is universal, and, as far as my observation goes and that of other writers, they are confined to one root, and these generally form, with the crown, a gentle curve; but in one specimen the whole tooth is as straight as we usually find the permanent teeth.

The indications all favor the supposition that these teeth originate and receive full development contemporaneously with the permanent teeth. There is nothing to indicate their connection with development and growth of the deciduous series. The structure of the enamel and dentine is very compact, more so than is usually found in permanent teeth. They are, in consequence, not easily affected by caries. Out of the large number I have met with, but one was in the least degree touched by disease.

The irregularity that they produce, amounting at times to excessive disfigurement, indicates but one course to pursue in their treatment, and that extraction. It is possible that one may present in normal position between the regular set in which extraction is not indicated, owing to its producing a greater irregularity in leaving too much space than to permit its retention.

Cases occur where the lateral teeth simulate the supernumerary. They assume the form of enamel needles, sharp and conical. This is but a tendency to that retrograde metamorphosis peculiar to all tissues, and especially to the teeth. We find the same tendency in all the roots of teeth retrograding to the three roots in the superior bicuspids of the quadrumana and the two of the inferior, and to a similarly increased number in the other teeth. Of course, any treatment here is out of the question; they must remain in the series.

This brings me to the consideration of other abnormal peculiarities.

Small nodules of enamel are found at the necks or between the cusps of teeth. These are productive of no ill results, but are interesting as an unusual development of this tissue. In the same light we may view the tendency to the before described retrograde development. I allude to the division of single rooted teeth into double, double into quadruple, &c. These are all familiar examples. I have numerous specimens of this change in all the teeth except the central incisor. The result of this change has special interest to the dental operator, and should be closely studied. It is impossible that operations, where there are exposed pulps, can ever reach perfection unless this abnormal characteristic is well understood and appreciated. It may be laid down as an axiom in dental anatomy that a depression in the roots of single rooted teeth indicates, at least, a tendency to two roots, and two roots indicate two canals. It is not necessary that these roots be separated. They may be distinct roots, or they may, as in the case of bicuspids and wisdom teeth, be united by cemental tissue. Now, while we always have two canals in the bicuspid, (a fact seemingly often forgotten,) we may have three. We may have two in the canines and laterals, though more rarely. It is possible to have four in the superior molars and five in the superior dentes sapientiæ, but it is to the inferior molars that we must look for the greatest amount of trouble in treatment. The great tendency of these teeth to develop four canals, if not four roots, is very often lost sight of. The dentist, if called upon to destroy the pulp and fill these roots, forgets this fact, and rests satisfied with the treatment of two canals. Of course two are left. The result is obvious; decomposition takess place in the pulps of those left, and we have, as a resultant, periostitis, alveolar abscess and the usual train of evils. My experience teaches me that this reason has largely to do with failures in filling roots, coupled, as it may always be, with bad manipulation. Years have conclusively demonstrated the truth of the assertion, that canals thoroughly filled in teeth not previously diseased, are effectually preserved from future trouble. The peridental membrane is only exceptionally irritated externally, but internally will always be affected through decomposition of tissue. Eradicate the cause, and the effect ceases. Fill the root thoroughly, and the obnoxious gases will have no place to generate.

The union of teeth is interesting as a fact, and becomes of importance in a pathological sense, when in the progress of disease such teeth require removal. The fact that teeth could be united in this way was doubted by some of the earlier writers, but specimens have accumulated to such an extent that we now know that any of the teeth may be united, and that during development. That this must take place during the saccular stage cannot be doubted, as teeth in my possession, united their entire length, fully prove. The fact has important bearing in extractions. The removal of one necessarily involves the other. The wisdom teeth are not uncommonly thus united.

This brings me to the consideration of the malposition of teeth, and especially that of the dentes sapientiæ. It must be understood that nature rarely exhibits a deficiency in the number of teeth, while it is not uncommon to have them in excess. Teeth may be absent from the series, in fact entirely edentulous persons are reported, but these must be very rare, as the reports have never been well authenticated. A bicuspid may be lost by carelessness in extracting the first superior deciduous molar or the second inferior, as it is well known the roots of these may converge and take in the crypt of the developing bicuspid. We may, however, feel very confident that a missing tooth has been prevented by some cause, from making its appearance, and is still buried in some portion of the jaw. I might cite numerous cases in proof of this, but the length of this paper forbids extended quotation. Suffice it to say, that teeth have been found in various positions, in many instances giving rise to the supposition of tumors, &c. It not unfrequently happens, that years after all the visible teeth have been removed, that other teeth will make their appearance, giving rise to the very natural idea of a third set of teeth.

I have no doubt but that from this has arisen this generally accepted idea that third dentition may take place. I would not be understood as denying the probability, but have seen nothing, either in theory or fact, to warrant a belief in it. This malposition, though not generally serious, may, as before remarked, cause serious difficulty. In one case a student of Pennsylvania College was a sufferer for some years, and had consulted surgeons in Europe and America without relief. A missing tooth in the series was suspected as the cause of trouble. The jaw was laid open, and an incisor tooth was found lying across the jaw and partially lying on the floor of the antrum. M. Forget mentions a case where the patient had been admitted to the hospital with a malady of eighteen months standing. It presented the appearance of a tumor in the palatine arch, with extensive ulceration in the face. Blondin and Marjolin, two distinguished surgeons, formed an unfavorable opinion of the case, but on commencing the operation, two molars were found buried in the palatine arch. Their removal, of course, effected a cure.

The malposition of the wisdom tooth is, by far, the most serious of all the lesions that we are called upon to diagnose. Pathologically considered, it is of vital importance. Growth, we all know, proceeds posteriorly, and if the harmony between the development of teeth and the growth of the jaw be maintained, there will be no irregularity; but if growth ceases, there must be malposition, because there is not room for the dens sapientiæ to take its place. It is on this account that many contend for the destruction of the first permanent molars. I have not space to enter into this discussion here, and can only say that facts do not warrant the wholesale destruction to which these valuable teeth are so frequently doomed. The simplest form of malposition is where one wisdom tooth outstrips the other in the opposing jaw. The occlusion will prevent development, and produce around the tooth so pressed, a circle of irritated gum tissue, kept so partially by the secretions and partially by the attrition of the opposing tooth. There can be no remedy here but the extraction of one or the other, and the sooner the better. The most formidable position is where it lies longitudinally with the jaw, abutting against the second molar tooth. Extraction here is both difficult and dangerous; difficult, because the forceps must necessarily clasp the crown, rendering fracture imminent. It is dangerous, because the contiguity of the roots to the large artery may rupture that and produce dangerous hemorrhage. Teeth in this position produce serious pain. Development can only proceed in one direction. The impingement of the crown on the distal surface of the second molar forbids it in that direction, consequently growth must take place posteriorly. In the course of time this growth presses on the principal nerve of the jaw, and constant and excruciating pains are the result. Now this tooth may be above the gum, or it may be entirely buried from sight. The examination should, in the latter case, be thorough. If the tooth is found and extraction decided to be inadmissible, then the second molar should be removed. The books are full of cases where the malposition of this tooth has been productive of the most serious results; in many instances lunacy and death.

TOO LITTLE SLEEP.

Students, as a class, do not sleep enough. There is no law so fundamentaal and imperative on the student as the law which requires him to sleep, and no other law does he so systematically and recklessly ignore.

It is a popularly accepted fallacy that students and literary men do not require as much sleep as mechanics and laborers. Physiology shows us that, during the operation of the intellect, rapid changes of tissue take place, and that a few hours of close application to thought and study exhaust the system more than two or three times the same period devoted to manual labor. It is evident, then, in order to compensate for this greater waste of tissue, that the brain worker will require more sleep than the muscle worker.

In the violation of this first great hygienic commandment is found the secret of most of the special diseases to which the student is liable. To this cause can be traced the eye affections that are so common. By neglecting to obtain sufficient rest, the system becomes relaxed and its tone lowered, thereby inviting disease, of which these organs, being especially overtasked and weakened, are the first to become sensible.

Original Lectures.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

TRIFACIAL NEURALGIA—OPERATION FOR ALVEOLAR NEURALGIA.

The patient before you has been kindly brought by a member of the class, in order that we should examine his case, and determine, if it is possible, to relieve him by operation or otherwise. He submits the following brief history of his case:

"G. L., aged 78½ years, a native of England, is a weaver by occupation, and a widower. Thirty-eight years ago he was seized with intense neuralgic pain in the right side of the lower jaw. This pain persisted for four years and then ceased. Sixteen years ago he had a tooth extracted on left side of the lower jaw, and pain of a violent character located itself there. About four years since the left superior bicuspids were extracted and pain was developed in this region."

On examination, it will be found that he has sacrificed the molar teeth on the left side of the lower jaw, and all the teeth of the superior maxilla on the left side, except the canine and incisors. These teeth, he states, were extracted in the vague hope of securing relief from the excruciating pain he suffers. Extraction of sound teeth in these cases is unfortunately too frequently performed without affording relief, and experience appears to warrant the conclusion that this method of treatment should be abandoned.

As he sits before you, you will observe that he suffers from constantly recurring paroxysms of pain, which are of the most violent character. These paroxysms occur in the alveolar border of the left superior maxilla, and in the alveolus and body of the left side of the inferior maxilla. Pressure upon the alveolar border of the upper jaw gives great pain. So intense is the pain constantly felt in this part that he is compelled to keep a small roll of cotton saturated with laudanum between the jaws; inhalation of cold air excites pain; he is able to eat soft food only, the contact of hard substances producing pain. On close examination of the alveolus, you will observe at the position of the bicuspid teeth a marked swelling. This point is the most sensitive. Outside of the oral cavity we find certain points on the left side of the face which are extremely painful to the touch, as well as regions which are more or less painful. Above the supra-orbital ridge, extending beyond the border marked by the roots of the fifth pair and to the left, we find the surface very painful when touched. The integument appears slightly congested and reddened. At the inner third of the supra-orbital arch, at the notch where the supra-orbital nerve and vessels emerge, there is a point which is quite painful to the touch. Pressure over the infra-orbital foramen, and to a limited extent over the surface of the cheek, produces pain. At the point of emergence of the inferior dental nerve, the mental foramen, and over the left lateral half of the chin, pain is elicited on placing the finger in contact with the surface.

These points and regions are not only painful to the touch, but pain exists in them constantly; pressure of the slightest character greatly aggravates the pain. The patient has been compelled to discontinue shaving on account of the pain provoked by the contact of the razor; the beard, also, appears to have become very stiff and harsh.

Returning to the oral cavity, we find that the patient complains of pain in the forepart and side of the left half of the tongue; he cannot use his tongue freely in the acts of mastication and deglutition, owing to the pain which is provoked; he states that, so far as he is able to determine, the sense of taste is not appreciably affected. The general health of the patient has been impaired by the long-continued suffering to which he has been subjected, and also by his inability to take food of proper kind and in proper quantity.

The brief *clinical history* furnished by our patient, with the well-marked morbid conditions which, by our examination, we have found to be present, lead us directly to a positive *diagnosis*. We have found certain points and regions which are the seats of constant pain, and of recurring paroxysms of intensified pain. Let us for a moment examine the anatomical relations of these parts. With the aid of this dissected specimen and diagram you will be able to examine the structures which enter into their formation; more particularly your attention is called to the course and distribution of the nerves which supply these parts. At the points corresponding to the painful spots on the facial surface of our patient, you observe nerves emerging which soon after divide into branches, and which are distributed to the regions found to be painful. These nerves are branches of the fifth nerve, known also as the *trifacial*, from the fact that it makes its appearance at three places on the face; and the *trigeminus*, from its having three divisions. Its distribution, as you see, is very large, and its functions are various. It combines the functions of a nerve of special sense, common sensation and motion, and its study interests you, especially by reason of its relation to the entire maxillary apparatus; it supplies the tongue with the special sense of taste, and at the same time common sensation; all of the muscles of mastication, except the buccinator, with motion, and all of the teeth with sensation.

We find, therefore, that the painful points in this case are the points at which the sensory branches of the fifth nerve escape from foramina, or bony canals, and the parts which are painful are supplied by the terminal branches of this nerve. This painful condition existing in a nerve is called *neuralgia.* As it depends upon no constant anatomical characters it cannot be defined as a disease. It is a combination of symptoms, and the *causes* which are engaged in its production are various. Among these may be enumerated, wounds of the nerves from sharp-pointed instruments, irritation provoked by the pressure of foreign substances, compression of the nerves by contracted cicatrices, pressure by tumors and by thickening of the dura mater; exostoses from bones and teeth; pressure produced by the congestion of bloodvessels, which accompany the nerves through bony canals; rheumatic neuralgia, that produced by catching cold, is supposed to be due to a hyperæmia and œdematous swelling of the neurilemma.—(*Niemeyer.*)

This patient assigns a curious cause for the occurrence of neuralgia in his case. He states that it made its appearance very soon after his first wife died, and persisted until he married a second time. At the death of his second wife the neuralgia again appeared, and has remained up to this period. He says, moreover, that the physician who treated him said it was of no avail for him to continue the use of medicines. This statement must be accepted with due allowance for the imagination of the patient. A curious coincidence has been worked up into an apparent cause by the impressions made upon the patient. If it is more than this, it is certainly difficult to offer any explanation.

The *treatment* of trifacial neuralgia is both medical and surgical. We infer that the former method has been exhausted in this case, and he comes to us to obtain relief by surgical means. The medical treatment employed should be adapted to the cause, if that can be ascertained. When malaria is the cause, quinine should be administered, and if this fails, resort should be had to arsenic. Where anæmia is present preparations of iron are indicated. In electricity we have an agent which has accomplished much in neuralgic affections. Cases are recorded in which trifacial neuralgia (tic doulouroux) of thirty years standing has been cured by the constant current. This success is certainly encouraging, and should lead to further trials.

The surgical treatment is limited usually to division of the nerves involved, or excision of a portion, although operations of a much more formidable character have been performed, such as resection of the superior maxilla, and where the neuralgia was due to the pressure produced by an aneurism, ligation of the common carotid artery. When other methods of treatment have proved fruitless, and the pain is of such character as to render the patient unfit for business, then interference with the knife becomes imperative. If possible, the nerve should be divided, or a portion excised between the point of disease and the brain, in the hope of obtaining better results. If this cannot be done we should not hesitate to operate upon the peripheral branches.

The second and third divisions of the fifth nerve have been divided at their points of emergence from the cranial cavity. Professor Carnochan, of New York, has divided the superior maxillary division by making an opening with the trephine, through the superior maxilla, cutting through the maxillary sinus, and thus reaching the spleno-maxillary fossa. Professor Pancoast, the distinguished anatomist, has divided the inferior maxillary division at the base of the skull, reaching it through the zygomatic fossa. These operations were followed by the happiest results.

Your attention has been directed in this case to the very painful condition of the alveolus of the superior maxilla; particularly one point about the position of the bicuspid teeth; the alveolus at this point is swollen and very tender. This condition of the process is called alveolar neuralgia, and attention was first directed to it by Professor Gross. In the *American Journal of the Medical Sciences*, for July, 1870, Professor Gross describes this form of neuralgia, and adduces five cases in which he had performed the operation of removing the alveolar border which was followed by the best results. This method of treatment is in accord with the views he entertains in reference to the pathology of the affection, believing that the minute filaments of the nerves are compressed in their osseous canals by the deposit of osseous matter. In these cases the osseous structure is abnormally hard. The removal of the alveolar border affords permanent relief by removing the nervous filaments which are compressed within the osseous canals.

As, in this case, this is the part which gives our patient the most pain, I propose this morning to perform an operation for the removal of the alveolar ridge. For this purpose I have provided, as you see, the proper instruments—a strong periosteal knife, with cutting-pliers and bone forceps. I divide the mucous membrane and periosteum over the border, and dissect them off by means of the handle of this knife; then I cut through the bone with these powerful pliers; I find the bone very dense and hard, as stated by Professor Gross. Having removed a sufficient portion of the alveolus, I replace the mucous membrane and periosteum. Union will readily occur, and, at the next clinic, I will report the results of the operation.

Leading Articles.

SUMMER COURSE IN THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The advances made in both medical and dental instruction, in the past few years, marks an era in American professional education. Although the steps of progress are not, as yet, many, the fact that these have been taken is a source of congratulation. Revolutions, it is said, never go backward, and we anticipate that the results will justify still greater advances. The influence exerted by the bold move of Harvard University has been far-reaching, and, we think, will be prolific in great results in the future. Medical institutions everywhere must occupy the same advanced ground, or submit to a loss of all the best minds. These will gravitate, naturally, to that school that offers the greatest inducements for a thorough education.

The dental schools have felt the force of this onward movement, and we find them, almost universally, becoming more stringent in their regulations and increasing the time of pupilage.

Situated as we are in this country, all changes must come by slow advances. Any radical modification of the existing order would tend to the total destruction of the institution attempting it.

The Faculty of the Pennsylvania College of Dental Surgery have long felt the necessity of increasing the time, but practical difficulties have seemed insurmountable. They have now so far overcome these, that they propose to continue the instruction in the College throughout the year. This will give two entire years to the study in addition to that previously had with a Preceptor.

The plan, as adopted, does not change the Winter Session, commencing in November, and continuing until March. The Spring Session commences the first Monday in March. That month will be devoted entirely to practical operations. The Lectures will commence the first Monday in April, and continue from five to six o'clock, P. M., daily, in connection with work in the practical department, until the last of June. The infirmary and laboratory will continue open during July and August, except the last week in August and the first in September. The Fall Course will commence the second Monday in September, and continue until the first Monday in November; being, in general arrangement, similar to that detailed for the Spring Course.

The carrying out of this plan necessarily involves a serious addition to the labors of the Faculty, and we hope that it will receive the cordial co-operation of the profession in aiding them to make it a success. Students, who contemplate attending, will bear in mind that, by this arrangement, they will not be required to secure a Preceptor during their stay in the city; the Faculty deeming the instruction received during the spring and summer months as more than equivalent, in value, to any private instruction, however good that may be; but such instruction is not to be considered in any way a substitute for the Winter Courses of Lectures.

ANSWER TO "J," OF THE MISSOURI DENTAL JOURNAL.

Our friend "J," in the December number, takes up the defence of the American Dental Association, in its action excluding delegates from holding office or serving on committees. He assumes the ground, that the Association is "composed only of permanent members, and will remain so until after it meets again and elects delegates, who do not desire to be considered permanent members, after which it will be again a mixed body." We would inquire when the "mixed body" legally ceases. "J" meets this point by the assumption that it ends with the session. Such an interpretation of the Constitution is wholly unwarranted by the text. There is not a shadow of authority for thus limiting the membership of a delegate.

If his explanation be admitted, then, when the Association becomes a "mixed body," the delegates must, according to the Constitution, have "equal rights and privileges" granted them. If they possess these, by what code of parliamentary practice, to say nothing of justice, can one portion of the body undertake to say how and when they shall exercise these rights. That the permanent members have arrogantly assumed this, we admit, but the possession of temporary power is but a poor plea in justification of an absolute wrong. Disregarding the wording and the spirit of the Constitution, these "permanent members" say, with "J," in substance, to the delegates, *we* constitute the body proper, your Associations are *privileged* to send delegates as long and as often as may suit your convenience: but you cannot expect, nor have you any right to expect, to hold office, serve on committees, or do anything, unless we, the permanent members, see fit to grant it! Are Dental Associations prepared for this interpretation of "J" and his associates? We do not believe they are. Having no argument worth the name, these gentlemen fall back on the old resort of tyranny, that "might makes right." We must express our surprise, that a mind as logical as our friend's should present such an exceedingly lame plea for such an unparliamentary act. We have the charity to believe his mind has been warped from its accustomed clearness.

If his view is to be the one adopted, then the assembly ceases to be a representative body and degenerates into an Association, whose privilege it will be to meet once a year to indulge the members in their garrulous proclivities at the expense of science. We believe in a different sort of an Association, and will use our influence, in every way, to have our conception carried out.

OBITUARY.

CHARLES HAMILTON, D. D. S.

Very few of our readers will, probably, have any knowledge of the name of this gentleman, yet to those who have been connected with dental education in this city, his death comes with startling suddenness.

He was one of the original corporators of the old Philadelphia College, and subsequently corporator and secretary of the Pennsylvania College of Dental Surgery, and has been for upwards of twenty years the constant and untiring friend of the institution. He was an almost daily visitor to the infirmary, and became well-known to every class of students, many of whom were constantly benefited by his advice.

He was always prepared for any advanced step, the last efforts of his life being devoted to changes that he thought necessary in the instruction, and which he did not live to see carried out.

Possessing ample means, he never devoted himself to the practice of dentistry, but had an enlarged appreciation of its value;

indeed, to use his own language to the writer a few days before his death, "he would not place it second to any of the professions." Regarding it in this, perhaps extravagant light, he always combated any attempts to underrate its usefulness.

The college will lose a warm friend in his death, and one whose place will not soon be filled. His interest commenced when Dental Colleges were in their infancy, and friends were few, and he has lived to see them placed on an enduring basis, and fully recognized by the most intelligent of the land. During all this time of varied experience in dental education, it is to his credit that his faith never wavered, but let the day be ever so dark, he could see light beyond. In this faith he continued to the last. If some of the more active in the profession could inherit some of the same spirit, dental schools would be further advanced to-day.

The mission of Charles Hamilton has ended on earth; may we, with equal earnestness, carry on the work.

OUR ENGLISH SUBSCRIBERS.

It gives us pleasure to be able to include so large a number of transatlantic subscribers as are enrolled on our list, and take this opportunity of inviting them to contribute some of the results of their experience to our pages. Although America seems to have taken the lead of the world in the establishment of independent Dental Colleges, for the purpose of affording sufficiently extended practical opportunities in mechanical and operative dentistry in connection with instruction in the other branches which form the basis of a thorough medical education, dentistry is nevertheless skillfully practiced throughout the civilized world, and there must be constantly recurring peculiarities in cases which may of themselves be interesting, or which require ingenious devices in their treatment. Reports of these would be invaluable to all of our readers, and we hope our subscribers abroad will avail themselves of our invitation to give us the benefit of their experience.

Proceedings of Societies.

DENTISTRY IN WESTERN NEW YORK.

The dental societies of the seventh and eighth judicial districts of the State of New York were organized, and are now at work, under "An Act to incorporate dental societies for the purpose of improving and regulating the practice of dentistry in this State."

Since their organization, they have held both annual and semi-annual meetings, for the advancement of dental science, and under their guidance dentistry in Western New York has taken a position that promises to be more than well sustained.

The By-Laws of the Seventh provide that its annual meeting shall be held at Rochester, while those of the Eighth provide that its annual meeting shall be held at Buffalo. By a mutual agreement entered into at the time the societies were organized, the semi-annual meetings are held at the same time and place—first at Buffalo, next at Rochester, and are called "reunions." This arrangement is practically a continuation of the old Western New York Association, which terminated its useful career under that name about five years ago.

The fourth annual reunion of these societies was held at Rochester, N. Y., October 29 and 30, 1872, and proved, as all agree, to be one of the best ever held in this region. The attendance was large, and the interest unabating. There was present a delegation from the Dominion of Canada—Messrs. Callender, Chittenden, Kelyea and Wolverton; also several of the medical profession of the city, all of whom took part in the discussion. The first paper was on

DENTAL PROGRESS.

BY DR. E. S. HOLMES, OF GRAND RAPIDS, MICHIGAN.

Improvements are indicated by the quality of work performed, and the methods involved in the accomplishment of that work. Dentists are practical working men; hence, in convention they present such subjects for discussion as claim their attention in the office.

From ten to twenty years ago the time of our meetings was taken up almost wholly in the discussion of subjects pertaining to artificial dentures; whereas, *now* it is consumed in the consideration of subjects pertaining to dentistry proper; that is, to the treatment of diseases of the dental organs.

Of the fourteen subjects presented at a meeting of the Michigan Dental Association, fifteen years ago, nine referred to purely mechanical work, one to fees, and but four to operative dentistry; while the last two sessions of the same society were devoted wholly to professional topics.

Dentistry is in a transition state from good to better, and our mission is, or should be, to carry it on to best. It has been said by a recent writer that "dentistry is in a *chrysalis* state." It has passed through the *embryo* and *larval* states, and is now well on in the chrysalis or transition state. During the first and second, the rule was to throw away as many teeth as possible, in order that their places might be supplied with that poor substitute known as the artificial denture.

If the teeth thus disposed of could be collected, they would be sufficient to bury a city as deep as Pompeii; if the groans, and cries, and tears, extorted from the victims of such malpractice could be aggregated, they would make a respectable prairie thunder-storm; if the blood spilt by such wickedness could be run into one basin, it would float a Great Eastern for a satisfactory trial trip.

But thanks to progress, to education, to skill, this destroying process is well nigh past, and our specialty will soon assume the *imago*—a perfect state of conservative dentistry. Look at education. How vividly some of us remember what was required of the dentist's apprentice (he could not be called a student,) a few years ago. His duty was to spend a few weeks or months in the laboratory, and get courage "to pull a tooth;" then calling himself a dentist, and appropriating the title of doctor, he went forth to practice—on the credulity of the people. Now it is demanded of a young man, about to enter the profession, that he should spend two or three years with a private tutor, and avail himself of college courses, clinics, &c., and to furnish, as proof of having done this, the diploma of some respectable dental school.

SYNOPSIS OF PAPER ON DISEASES OF THE GUMS.

BY DR. H. S. MILLER, OF ROCHESTER, N. Y.

The more immediate diseases to which the gums are liable arise from local irritations, a common one of which, and probably the most frequently met with, is a deposit of salivary calculus, the treatment of which consists in its removal. And here let me urge the necessity of its entire removal, and the thorough polishing of the tooth. All know the effect of even a small scale of tartar, especially the dark, hard variety, deposited far up under the gum, sometimes to the very apex of the root, the result of which is constant irritation, terminating in ulitis, and possibly loss of the tooth.

As before stated, thorough removal is necessary, and with good effect; where the gums are badly inflamed, a wash of dilute carbolic acid or some astringent may be applied.

The gums are indirectly liable to some diseases, a proper diagnosis of which is very uncertain. These diseases, of course, require systemic treatment, and it were well for us, as a profession, if we understood better than we do the whole physical organism, a part of which we are constantly operating upon.

For example, the difficulties arising from a too free use of the different mercurial preparations are very similar in their nature to scorbutus. The same local remedies would perhaps apply in either case; but in systemic treatment quite different remedies are necessary. For ulitis, the result of mercurial impressions, tincture of iodine, applied locally, is very prompt in its action. Indeed, this remedy is almost indispensable in most of the diseases of the gums.

Chlorate of potassa and sub-borate of soda, though not always quite so active, are also beneficial. Many of the diseases to which the gums are subject have their origin in tertiary syphilis, the periosteum of the alveoli being, either directly or indirectly, involved. As an example, though, perhaps, not entirely pertinent to the subject, I have a patient now under treatment, sent me by a medical practitioner, who had had no apparent trace of this disease for twelve years, when suddenly it made its appearance in the gums surrounding the left cuspid, lateral and central incisors, I found the immediate cause of the diseased condition of the gums to arise from necrosis of the alveoli of these teeth. My treatment was first to excise this necrosed bone, and after daily syringing the parts involved, to apply dilute tincture of iodine. Result not satisfactory. Then tried carbolic acid with, however, no better effect. Finally resorted to strong solution of nitrate of silver, and with such success that granulation has taken place, and the case nearly cured. Meanwhile iodide of potassium was given internally.

A very frequent cause of disease of the mucous membrane of the mouth and gums is the wearing of artificial dentures improperly adjusted, or of improper material. Especially is this the case where the teeth are mounted on the Goodyear-Cummings-Bacon patent vulcanized rubber. The only remedy is to remove the plate, apply astringents, and curse Bacon and the day rubber was first introduced to the profession.

As regards absorption of the alveoli, recession of the gums and deposition of salivary calculus, no reliable treatment has as yet been put forth of a permanent character. In this direction there is an almost unlimited field for the dental practitioner. Unfortunately with far too many, pecuniary success is the only consideration. As Holland says with regard to our country, so say I with regard to our profession: "God give us men! A time like this demands strong minds, great hearts, true faith and ready hands."

SYNOPSIS OF PAPER ON DENTAL PROBABILITIES.

BY G. P. PALMER, OF P———, N. Y.

Earnest laborers, with strong desires for the advancement of the profession, have provided the means, possibly the way, by which dentistry is to be perpetuated. Longer time of pupilage and a college course are prerequisites to success for those who would enroll themselves as dentists. With the knowledge gained from the perusal of the college announcements and reports of dental societies throughout the land, we may safely write out the probabilities of coming dentistry. By lending aid and influence to our dental schools, by establishing local societies in the unorganized districts, the emancipation of dentistry from ignorance and empiricism will be but a matter of time. It is largely composed of men who entered it with but limited qualifications, not to their discredit; for such was the custom, even the necessity;

but to-day, as the result of organization, a line is drawn, a platform raised, and the invitation to come up higher extended only to the qualified—the qualifications being education, merit. The majority of our leaders started upon a common plane. Education was the thing to be obtained. Lack of opportunity was made up by vigorous application of whatever means would overcome the obstacle. So the world has come to regard the self-made man as the incarnation of will, of perseverance. For those yet to enter the profession, we have but little fear as regards qualification. The question is, "What can be done for the inefficient in practice? Dentistry at best is but a school, and one in which each should be willing to instruct. Let those who have received aid on their way to higher places show their gratitude by giving cheer and encouragement to those in need. Much of dental exclusiveness arises from want of knowledge of the real benefit to be derived from social exchange of ideas. Convince a dentist that it is really for his interest to attend dental meetings, and his attendance is assured. There is no just reason why we should hold a brother dentist in less esteem than a fellow-citizen, simply because he happens to follow the same calling. As we come into more intimate relations, we find that our preconceived notions are like the tail of a comet—they vanish in thin air. As regards popular dental education, individuals and associations have experimented repeatedly, but have failed for want of proper encouragement. There certainly is a demand for such education, and we are glad to learn that certain associations are moving vigorously in the direction indicated. The profession is to be provided with cheap circulars, teaching "how to care for the teeth." The good work is not to end until such instruction is woven into the child's book of lessons, and taught in our common schools. Probabilities point strongly to a wide separation between operative and mechanical dentistry. The fact is plain to all, that skill will not be applied alike through one class of instruments or materials. Whatever, upon trial, will best harmonize with individual peculiarities, will be the thing to use. The question of heavy and light, lead or wood mallets, the number of gold foil, or gold of other forms, cohesive or soft, will need no committee to decide upon their merits, but will be decided as are our religious creeds, by the law of natural selection. Two things we greatly need, *knowledge* and *contentment;* knowledge to use the instruments and materials with which we have to do; contentment to practice faithfully and honestly in the places where circumstances seem to have placed us.

There still are some who have not yet enjoyed the bliss of using the "Rubber dam." We are told that they get along without it. So did every one before its introduction, and we know with what success. Yet there is a limit to its practicability, if not to its use. There are cases in tooth plugging in which, by any means, it is almost or quite impossible to keep dry during the introduction of cohesive gold. To fill a tooth properly with cohesive foil requires skill, applied according to laws governing such operations. The same skill, if applied according to the principles of wet filling, will accomplish the end just as well. We mention this as a probability, that when necessary or convenient, teeth will be filled as effectually by the wet process as they now are by its opposite.

The use of cylinders is one way by which this will be brought about. Gold screws will substitute, in the majority of cases, the anchors of present practice. In the preparation of gold for filling there is promise of great saving of time now consumed in rolling cylinders, folding strips and forming pellets. When a sufficient number of operators adopt one style of filling, or make use of a certain preparation of gold, there will not be wanting nimble fingers and skillfully contrived machines to supply their wants. Burring engines have come into use upon their own merit. The question to decide is, which invention will best meet the requirements, or what power shall be used in propelling? Foot-power and electricity are rivals—the former has the advantage of early introduction, while the latter, for speed, "has never been beaten."

Our achievements are truly great, yet in principles of practice we are not out of the condition of our ancestors, save in the application of our operations. They substituted for the organs of mastication artificial dentures, while we preserve the natural ones. In this advance nearly all effort, has been to remedy effects, their causes being regarded as inevitable. The next advance will be to restore to nature the materials of which our refined tastes have robbed her, and that, too, without resorting to the usual oatmeal and Graham diet. This is the work of the coming dentist.

The following completes the list of papers presented at this meeting:

Facial Neuralgia, by Leon T. Harvey, Buffalo, N. Y.; Dental Education, by Geo. T. Barker, Philadelphia, Pa.; Abnormal Dentition and Results, by James Truman, Philadelphia, Pa.; Anatomy and History of Deciduous Teeth, by W. C. Barrett, Warsaw, N. Y.; Sections and Sectional Filling, by J. Edward Line, Rochester, N. Y.

It is expected that the first of these will appear in the *Missouri Journal*, the second in the *Dental Cosmos*, the third and fifth in the *Dental Times*, and the fourth in the *Canada Journal*. The papers by Messrs. Truman, Barker, Palmer and Holmes were contributed on urgent solicitation, and after their reading the following resolution was introduced and adopted:

Resolved, That the thanks of this convention are due, and are hereby tendered, to Profs. James Truman and Geo. T. Barker, of Philadelphia, Pa., and Dr. E. S. Holmes, of Grand Rapids, Mich., for the very interesting and valuable papers contributed on this occasion; and further

Resolved, That the Secretary be hereby instructed to notify each of the above gentlemen of this action.

Dr. S. B. Palmer, who not only prepared a paper, but was on hand to back it, was given a rising vote of thanks.

Geo. J. Pack, of New York, was introduced, and upon invitation gave those present some information concerning the manufacture of gold for dental purposes. His remarks were to the point, and gave entire satisfaction. He exhibited several preparations of gold of his own make—pellets or blocks, and foil. The former were soft, cohesive and tough in the extreme, while the latter, because of its softness and toughness, could be compared only to a "piece of kid."

In the evening of the second day Chas. Forbes, M. D., of the Rochester Free Academy, delivered a lecture on the microscope, its history, construction, application, &c. This proved a treat and was duly appreciated. The lecture was illustrated throughout by plain and colored diagrams, the blackboard and first-class instruments. At the close of the lecture each of the fine instruments was supplied with recent preparations of teeth, bone, blood, &c., and members invited to see for themselves.

While this was in progress, W. C. Barrett, of Warsaw, N. Y., in a neat speech, presented to Dr. F., in behalf of the societies, a copy of "How to Work with the Microscope."

Among the articles on exhibition were Southworth's operating stool, Woodward's automatic plugger, Elliot's dental burring engine, the coraline base; also, models and abnormal specimens illustrative of papers and cases in practice. The next meeting will be held at Buffalo, N. Y., October, 1873.

J. EDWARD LINE, *Secretary of the Seventh.*

Reviews and Book Notices.

The Pathology of the Teeth, with Special Reference to their Anatomy and Physiology. By Carl Wedl, M. D., Professor of Histology in the University of Vienna, &c. Translated from the German by W. E. Boardman, M. D. With notes by T. B. Hitchcock, M. D., D. M. D., Professor of Dental Pathology and Therapeutics in Harvard University, &c., pp. 443. Lindsay & Blakiston, Philadelphia, 1872.

We briefly noticed this work in our last issue, time not permitting of extended examination.

In considering a work of this character from the dental stand-point, it must be borne in mind that the writer is not a dentist, but, as the title page announces, "Professor of Histology, &c., in the University of Vienna." It is manifestly unjust, therefore, to criticise it in its practical bearings. We have been, however, impressed with the remarkable care with which all such portions have been prepared.

The author describes in the preface many of the difficulties he encountered, and the obligations he was under to the lectures on dentistry, by Dr. Heider.

His position toward dentistry will be understood by the following from his Introduction: "If it be asked, with reference to the history of dental science, why the doctrines of the latter have matured at a comparatively late period, the answer is obvious, namely, because its study was not pursued systematically as that of a natural science. * * * *

"As the mass of material to be digested accumulated, the necessity of a further and further division of labor in the field of natural sciences became apparent; and from this principle of division has resulted, among others, the branch of dental science; this was elevated to the rank of a special study, and demanded, therefore, special instruction, which, in England and the United States of America particularly, has attained a high degree of excellence. During the last ten years, thanks to the exertions of individuals, dentistry has entered upon a scientific career in Germany, and there is reason to expect that it will soon be rescued from the realms of mere empiricism."

Part first is devoted to Anatomy and Physiology, commencing with the frame-work of the cavity of the mouth, the articulation of the lower jaw, and the action of muscles in the movements of mastication. The teeth are then taken up in regular order, and minutely described. This is followed by descriptions of the hard tissues of the teeth, commencing with dentine. His views on the "dentinal sheaths" of Neumann may be found in the following extract from the note on page 44: "E. Neumann, (Beitrage zur Kenntniss des normalen Zahn-und Knochen-gewebes,) maintains the existence of special calcareous sheaths of the dentinal fibres. These he calls *dentinal sheaths*, and he asserts that they may be isolated, while he bases his opinion upon the ground that maceration or incineration destroys the fibres, and that the felted mass of filaments which remains after the destruction of the basis-substance by means of hydrochloric acid, must be regarded as the persisting sheaths of the fibres. The correctness of this theory of the destruction of the fibres by maceration or by incineration I am inclined to doubt, until a distinction is established between the fibres presented in a non-macerated specimen of dentine and those which are isolated in one which has been subjected to the process of maceration.

"The view which seems to me most plausible is, that the dentinal fibres consist of a cortical, more dense, and a central vitreous substance, which latter dries up as soon as it is exposed to the air so that the dentinal tubules become filled with air. The familiar luminous ring which, in transverse sections, is seen to surround the dentinal canals, and, upon the theory of the existence of an isolated sheath, is interpreted as a calcareous dentinal sheath, in my opinion, is to be regarded as a homogeneous basis-substance, which invests the dentinal tubes like a sheath."

We cannot discover that he develops any new ideas in regard to the tubulated structure or the use of the soft fibre of Tomes, in its interior, neither is there anything to add to our present knowledge of enamel or cementum. His opinion of the character of the inner-tubular tissue may be gathered from the following quotation, page 56: "We know, from the clinical operations of J. Tomes, that the outer surface of the dentine is remarkably sensitive to the action of mechanical and chemical agents, and the same is true of the inner portions, though in a less degree. * * * He has succeeded no better than others in proving a connection between dentinal and nerve fibres. The anatomical reasons for the sensitiveness of the dentine remains, therefore, a postulate."

The intricate subject of "Development of Teeth" is very clearly written, from original investigations. Justice cannot be done the author by extracts; he must be read as a whole to be understood. In regard to the resorption of the deciduous teeth, his views differ somewhat from Tomes. "The organ of resorption probably is developed from the connective tissue of the root-membrane of the milk tooth, and from the medullary matter of the adjacent osseous tissue, and is, essentially, a granulation tissue, similar to that which we find in many inflammatory affections of the bone, or in tumors which are developed in the osseous substance. We also find, on the one hand, upon the periphery of sarcoma, cancer, &c., a resorption of the contiguous bone, and on the other hand frequently a growth of trabecular osseous tissue. Therefore, during the shedding of the teeth, an hyperæmic condition occurs in the root-membrane and the medullary matter of the bone adjacent to it; the activity of the cells becomes augmented, in consequence of which the whole process of nutrition is carried on more rapidly than under ordinary conditions; the young, more vigorous, cells supplant the older enfeebled ones. In the organism of youth, also, we find that in the growth of bone there occurs upon one side resorption, and upon the other production; as, for example, in the flat bones of the skull resorption occurs on the inner surface, growth on the outer surface, which is in relation with the galea aponeurotica. Again, in the tibia, resorption takes place in the central medullary canal, and growth upon the periosteum and epiphyses."

He does not seem disposed to consider third dentition an impossibility; for "it cannot really be denied that germs may lie dormant for many years in the animal organism, until they are subjected to favorable conditions which enable them to develop."

The part devoted to "Irregularities" may and probably will be condemned as not full enough; but it seems to us to cover the ground in a pathological sense. Practically, it is necessarily deficient.

In the part devoted to "Irregularities of Structure," we find full and accurate descriptions of abnormal developments. Our author makes a distinction between the fusion of entire teeth and where they are united in double or twin formations. "A complete fusion is not conceivable, except it occurs in a dental sac common to the two teeth, and since we know, from the history of its development, that the formation of the dental sac belongs to an early period, therefore the fusion must necessarily be of early origin. We are able to go still farther, and say that the fusion ensues cotemporaneously with the first development of the enamel organ and dentinal germ." Of "Twin Formations," he says: "That instead of a single, there is formed a double dental germ, which remains enclosed in a single dental sac, and as a result of this a partial or complete fusion of the twin formations ensues. There are, consequently, two crowns and two radical portions belonging to the same kind of tooth. Herein lies the distinction between twin formation and the fusion of two teeth."

Under the head of "Inflammations of Dental Pulp," we find the following erroneous statement: that "the suppurative process is developed almost always as a sequence of caries." This process may or may not be dependent on caries. Inflammation in this organ may, and does frequently, arise from other causes; nor does it, in our judgment, necessarily follow that the suppurative process must take place to reduce the pulp to a necrotic condition.

The chapter on "Inflammation of Root Membrane" is subject to criticism. It is singularly deficient in detail, and at times erroneous in statement. On page 208, we find that "the tooth sometimes appears to be longer than usual, and loose; which, however, is merely an *imaginary sensation* on the part of the patient." On the next page he says: "The periosteum of the root presents a gradual increase in thickness toward the apex of the root." Now it is well known by every dental operator, that elongation of the tooth is not imaginary, but real. The tooth absolutely interferes with perfect articulation. It is also equally well known that this effect is produced by the thickening of the periosteum during acute inflammation in that membrane. The one is the natural sequence of the other, and we are surprised that the author did not see it.

A marked evidence of the difficulty of a non-practical person writing on a practical subject occurs on page 213, where, enumerating the causes of inflammation of the periosteum, he says: "If the pulp be irritated by a *too early* filling of a carious cavity." If he had said by a *too late* filling, it would have been nearer the truth. Inflammation of the pulp from a superficial cavity is one of the rarest of results. The same lack of information again occurs when he says, page 218: "The upper canine teeth are less frequently the subjects of a suppurative inflammation of the root-membrane. When they are attacked, the disease is generally an extension from the lateral incisor, or from the first bicuspid." Slight inflammatory extensions do occur from one to the other teeth; but the writer has yet to see alveolar abscess extend from one to the other, unless the inflammation has extended to the periosteum of the subjacent tissue, and necrosis resulted. These are exceptional, and generally dependent on other conditions.

As a remarkable instance of the danger of fistulous tracks being carried to great distances, he illustrates by the following remarkable case: "Several years ago I (Prof. Strasky) was consulted by an elderly lady in regard to a set of artificial teeth. Presently, to my surprise, she began to arrange the dressing of a purulent ulcer upon the left side of the chest opposite the armpit, in the region of the fourth or fifth rib. * * * When I examined the mouth for the purpose of fitting the set of teeth, I found the left lower wisdom tooth deeply imbedded within the gums; the crown was quite destroyed by caries; the gums around were detached, sensitive, and upon pressure pus oozed out of them. As I had previously conjectured that the ulcer upon the thorax was dependent upon an affection of the tooth, I applied pressure from the angle of the jaw along the surface of the neck to the region of the ulcer, and became satisfied that pus escaped from two points of the ulcerated surface. The carious tooth was extracted, and the ulcer healed."

In order to test whether the processes of the dentinal cells entered the diaphonous portions of senile dentine, he treated cross sections by means of heated dilute hydrochloric acid, when the processes in question were brought into view. In order to prove whether these processes still retained the power of imbibition, "thin cross sections of the latter, in a dried condition, were heated slightly, and placed in a strong ammoniacal carmine solution, and afterwards treated with dilute acetic acid." It was found the coloring matter had penetrated to the finest ramifications.

On page 253, in writing of the depressions found at the necks of teeth, he says: "Dentists have not made any extended investigations in reference to this point," and refers the cause, probably, to the "tendinal expansion observed upon the facial surface of the gums of the lower jaw." It is very evident that the cause can only be found in the frequently acid conditions of the secretions at that point. Collecting there, and shielded by the folds of gum tissue, they are not neutralized by the alkaline saliva. The rapidity of this action is at times remarkable; the writer having observed the cutting edge of an incisor worn away to the depth of one-sixteenth of an inch in four weeks' time by the same cause. The same action is observed in the so-called wear of clasps.

In writing of green stain, he says: "It must be scraped away with a sharp knife, when the enamel will be found bright and intact." This is only exceptionally true. The genuine green stain, it is well known, is the most destructive deposition we have to contend against. He says examination shows it to be "a minutely granular mass which is morphologically identical with the matrix of leptothrix."

He disposes of the idea that tartar originates with vibriones in the following paragraph. We were under the impression that this rather remarkable idea originated with one of the professional brothers in this city. "Mandl has advanced the view that tartar is composed of a cluster of vibriones, which are encased in a coating of lime. Though it is true that parasitic organisms participate in the formation of tartar, nevertheless the view of Mandl is untenable, according to the ideas of the present day, since the supposed vibrios are constituent portions of leptothrix, and possess no calcareous coats."

The history which he gives of caries of the teeth is interesting, and as a *resumé* of the theories held is worthy of careful reading. He gives due prominence to the theory of Leber and Rottenstein of the proliferation of leptothrix into the tubules as the cause of caries, and acknowledges that "one may readily convince himself, both in longitudinal and transverse sections, of the violet color which is imparted to the contents of the canals. Hence, by their proliferation, the grains of leptothrix occasion the manifold swellings and varicous enlargements of the fibres, and are so closely cemented together that their connection cannot be broken, even after the action of heated hydrochloric acid." While he admits this, he does not believe that this proliferation can occur "until the decalcification of the dentine is complete," or, at all events, until the "first stage of the process. * * * The extension of caries in the dentine, therefore, according to my view, is affected by acid and not by the fungus." He sums up his views as follows: "From the foregoing observations, it appears that caries of the teeth is a process which has its origin chiefly in the abnormal secretions of the gums, and likewise in those of the rest of the oral mucous membrane and the salivary glands, and, commencing at suitable points upon the exterior of the tooth, spreads in the direction of the pulp-cavity. In consequence of the decomposition of the secretions, acids are formed, which extract the calcareous salts from the hard tissues, and give rise to a disintegration of the affected portions of the latter, in which no inflammatory reaction occurs. The destructive process is promoted, essentially, by the accumulations of secretions and particles of food and opportunity is afforded for the proliferation of leptothrix buccalis in the dead and softened dentine. The exclusion of an acid in the development of well-marked chronic caries, (caries sicca, carbonacea of writers,) is not established upon scientific grounds."

We are, therefore, left by him as much in the dark as ever. That acid secretions are a primary cause of caries, has been well understood for a long period; but every operator knows that this alone does not meet the difficulties presented. If Leber's view is erroneous, then the whole subject still remains where it was a quarter of a century ago.

The balance of the volume is devoted to "Neuroses."

The work, as a whole, is a valuable addition to our literature, and should be in the hands of every dentist; but the practical reader will rise from its perusal disappointed. It cannot be said that it enlarges our sphere of knowledge to any great extent. The American dental student has thoroughly traversed the ground here presented. In this respect, at least, the German mind is in no degree in advance of our own knowledge, and in many points lagging behind. We, however, gladly welcome this information, so compactly placed. This volume and the atlas are a noble contribution to dentistry, and cannot be too highly prized.

A System of Oral Surgery, being a Consideration of the Diseases and Surgery of the Mouth, Jaws and Associate Parts. By James E. Garretson, M.D., D.D.S., pp. 1075. Philadelphia, J. B. Lippincott & Co., 1873.

This, to use the author's language, is, "though greatly modified and enlarged, and under a different title, a second edition" of the work previously issued under the title of "A Treatise on the Diseases and Surgery of the Mouth and Jaws and Associate Parts." This we reviewed at length at the time of its appearance.

The present volume comes to us greatly enlarged, and, if large books be considered a "great evil," this is fast approaching that condition. We do not, however, wish to be understood as endorsing this sentiment, providing the author has not run into diffuseness.

The objections urged against the first edition have, to a large extent, been removed; but we still find a vein of egotism running through the whole volume. We use this word for want of a better. We admire self-confidence, but it may sometimes run to extremes. This is evident in the chapter devoted to "Dentition," where the author summarily disposes of the views of investigators in development of the teeth, "because no one of them is fixed in his deductions or conclusions," while *his* "simplify the matter very much indeed--deprive it of a very great share of its obscurity." We fail to discover that this promise is fulfilled; indeed, we are left in very great doubt in regard to many things.

We fear that what the phrenologists call the organ of comparison cannot be fully developed in our author, or he would have devised a better simile than the following, the italics our own: "This sac enveloping the papilla has its continuation, as is seen, necessarily over the sides of the groove, enlarges and deepens, and finally envelopes the papilla; it is seen that the body or tooth-germ gets a second sac. It is as though one should *envelope his head in a double night-cap, and then bind over this a handkerchief;* the submucous structure of the lateral walls and operculum representing the *handkerchief.*"

Under the head of "Local Treatment of Dental Caries," we have a tolerably full consideration of practical manipulations. This is a very great improvement over the first edition, and is, probably, sufficiently extended to cover the objects aimed at by the author.

We observe many additions to other parts of the work, exhibiting careful revision on the part of the author, with a laudable desire to make it as thorough, on the different subjects treated, as possible. We think in this he has mainly succeeded, and deserves the credit of giving to the medical and dental professions the best work extant, to our knowledge, on oral surgery.

The illustrations are profuse, but not original. We have ceased to expect any American book to be issued, except it be decorated by borrowed plumes. It is bad enough to meet with cuts that have become old friends by their constant reappearance; but when to this is superadded illustrations that come to us every month in the journals, we hardly have patience to read the text. It is a very economical practice, doubtless, for publishers, and very kind in dental depots to furnish such cuts; but the feeling is that more originality in this respect would enhance the character of the work, by elevating it above the suspicion of mere book-making.

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Hand Book of Physiology. By Wm. Senhouse Kirkes, M. D. Edited by W. Morrant Baker, F. R. C. S., Lecturer on Physiology and Assistant Surgeon to St. Bartholomew's Hospital, &c. With two hundred and forty-eight illustrations. Eighth Edition, 12mo., pp. 835. London, Jno. Murray, 1872; Philadelphia, Lindsay & Blakiston.

As stated in the preface, the eighth edition of this valuable text-book is the result of an increased demand, involving the necessity for a reprint at an earlier period after the publication of the seventh, than was anticipated. The opportunity has been seized for making corrections and additions where they appeared most needed, but the present issue is in great part a reprint of the edition of 1869. As no notice of the seventh edition, to our knowledge, appeared in American journals, we fear that it is not as well known as it should be. No text-book was better known in its day than the Hand Book of Kirke and Paget, of which this edition by Baker, is really an extension. It has passed, however, through so many editions since that of which the American edition by Blanchard & Lea is a reprint, that it is quite a different book—indeed, would scarcely be recognized. This fact is important, since the American reprint of this old English edition is still offered for sale, and is the book which would be furnished by most American booksellers, if care is not taken to ask for the seventh or eighth English editions.

In its enlarged and revised form we believe it to be for students, the best text-book of physiology in the English language, and have recommended it solely to our classes for several years. Our reasons for this belief are that it in its revised state, represents more thoroughly than any other English text-book the present state of physiology, furnishes a fair and equal consideration of all subjects, and yet by its appropriate size, permits the student amid his many absorbing engagements to compass in his reading the ground covered by the lecturer in his demonstrations.

In thus speaking we have no desire to disparage other valuable treatises which are at once more comprehensive and exhaustive, and more suitable for the wants of the working physiologist. We are at present only referring to the wants of students.

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Transactions of the American Dental Association, at the Eleventh Annual Meeting, held at White Sulphur Springs, Va., commencing August 1, 1871, and the Twelfth Annual Meeting, held at Niagara Falls, commencing August , 1872. Chicago, 1872.

We have received the above, rather pretentious, volume after paying in full for it. We have given it a careful examination, and have come to the conclusion that if American dentistry can make no better exhibit than this, the sooner conventions or associations cease to publish their proceedings the better for our reputation. It is, in plain terms, a disgrace. The committee have, probably, done their best with the material on hand, and we find no fault with the general make-up of the volume ; but they are open to severe censure in allowing the matter to go to press without careful revision. The reports are simply execrable. It is folly to spend a large sum for, so-called, phonographic reports, which any ordinary long-hand writer might excel. The gentleman who performed this duty evidently had his favorites, and for them he tried to do his full duty. The remarks of the balance were slurred over without any apparent attempt at faithful reporting. We do him the credit, however, to say, that he sent his report to the speakers for correction—a very proper course. The committee had no right to go to press until these were in. In the confusion attendant upon all large gatherings a speaker may not clearly define his meaning, or the reporter may misunderstand him. It, therefore, becomes essential that the report be revised. If other speakers have been placed in as ridiculous dress as the writer of this they have our sympathy, and will doubtless agree with us in the hope that the book may sink into an oblivion from which there shall be no resurrection.

The Physician's Visiting List for 1873. Twenty-third year of its publication. Lindsay & Blakiston, Philadelphia.

Few physicians are found without this conveniently arranged volume, and it is not likely that anything we can say could increase its popularity among them. But it is almost equally convenient for the dentist, although, fortunately for him, he is not so likely to be called upon to avail himself of much of its valuable information as to antidotes, &c. With a few omissions and perhaps a few additions, such as any practical dentist could suggest, the "Appointment List" would become as indispensable to him as the Visiting List now is to the physician.

Selections.

PRACTICAL HISTOLOGY IN VIENNA.

[A Communication to the Biological and Microscopical Section of the Academy of Natural Sciences of Philadelphia.]

BY JAMES TYSON, M. D.

At the request of the secretary, I have consented to give a verbal account of a recent brief experience in the laboratory of Prof. Stricker of Vienna, though conscious that I shall necessarily state some facts which are elementary, and familiar to many members of the section.

I am confident, in the first place, that those who are not familiar with the so-called "laboratories" abroad will be disappointed with the simplicity of their appointments in the majority of instances. Thus, the laboratory of Prof. Stricker consists of two moderate-sized apartments, one about thirty feet by fifteen feet, and the second half as large, with a still smaller private room, occupied by the Professor himself. In the largest room is a plain pine table, painted black, capable of accommodating eight or probably ten gentlemen with their microscopes. In the centre of this room, also, is a table like an ordinary dissecting table, on which investigations are made upon animals, generally rabbits and dogs, secured in position by means of Czermak's "rabbit-holder." This consists of a rectangular piece of board perforated at the sides and one end by holes, through which cords can be conveniently passed. At the remaining end a semicircular piece is sawed out, producing a concavity which will conveniently receive the back of the neck of the animal, in the mouth of which is placed the well-known "bit" of Czermak, which effectually protects the experimenter from the bite of the animal. The perforated board and bit are adapted in size to that of the animal upon which the investigation is to be made, those used for large dogs being, of course, much larger than those used for rabbits. The animals experimented upon are generally curarized, the curare being kept in concentrated solution in glycerin, diluted for use, and introduced hypodermically. In this room is also a kymographion, protected by a covering of green baize, and made in the laboratory by one of Professor Stricker's "diener," who did it in something less than a year In addition to these are closets along the wall, for chemicals, solutions, etc., microscopes and other apparatus when not in use. The smaller room contains a similar table for microscopic work, and is generally occupied by the assistants, while the pupils work at the table in the larger room.

From this description, which may be considered as applicable to a number of laboratories which I visited, it will be seen that the word *laboratory* is properly used to indicate a work-room, or place to work in, quite consistently with the etymological and primitive meaning of the term. The supply of material appeared to be abundant, as to frogs and smaller animals; but I have known as much as ten florins (about five dollars, and really equivalent to ten dollars with us) to be paid for a large dog.

Quite an institution in the laboratory are the two "diener," or servants, one of whom is a good mechanic and makes much of the apparatus used in the laboratory; but the deliberation with which he does it is something remarkable, especially to Americans. I am sorry to be able to say nothing more favorable of "Louis," the second "diener," than that he is an adept at fastening dogs, and at omitting to do anything which may be requested of him.

Although furnished with accurate information as to the situation of the Pathological Institute, I wandered for some time among the various quadrangles and courts of the great General Hospital before I succeeded in finding the laboratory. My knock at the door was answered by a lusty "*Herein.*" Entering, I found several gentlemen in shirt-sleeves working over microscopes, one of whom responded, in very good English, to my inquiry for Prof Stricker, to the effect that he was the person. I found him much younger, and very much less a "bear," than I had expected; apparently less than forty years of age, of medium stature, wearing no whiskers, except a moderate mustache, and dressing neatly. He treated me most courteously, and, on learning the object of my visit, very promptly effected an arrangement by which I was to work a certain number of hours daily with one of his assistants, Dr. Spina.

The microscopes used in the laboratory, and in Vienna generally, are Hartnack's, also Hartnack's lenses; and I saw no others there. The highest power used was an immersion No. 10; but this was frequently called into requisition. The great size and the reputed conveniences of our own and the English stands are not at all appreciated, and the beautiful stand of one of our best American makers, brought to Vienna by an American surgeon, was a source of considerable merriment to those who saw it, who regarded it as a sort of machine. The microscope is altogether used in the vertical position; and the precaution so much insisted upon among us, of keeping the unemployed eye open, was considered, at least by those who taught me, absurd advice, and by many had never been heard of. It may be added that the microscopes used by the assistants and students are the property of the Pathological Institute.

Having finished the subjects of blood and epithelium in the laboratory of the Brown Institution in London under the direction of Klein, we passed directly to the study of

CONNECTIVE TISSUE.—For this purpose a small portion of the mesentery of a living frog is placed upon a slide in a drop of serum or one-half per cent. solution of chloride of sodium, and covered with a thin glass cover. Five forms of cells are met with in connective tissue.

1. The *wandering cell*, exhibiting its peculiar amœboid movement resulting in a change of shape, to which is added, also, a change of position. This connective-tissue corpuscle assumes a permanently round form on the addition of water, when it may be said to be dead. These, in some instances at least, are probably white blood-corpuscles which have migrated through the walls of blood-vessels into the connective tissue.

2. The well known, coarsely granulated (grob-granulirt) *spindle-shaped* connective-tissue corpuscle, provided with an elliptical nucleus.

3. The *round, finely granulated* (fein-granulirt) connective-tissue cell, which exhibits no movement, or at least a very slow one, and differs only from the dead amœboid cell in its larger size. These generally have an oval nucleus, or, according to Rollett, their contents may appear to be accumulated at one point around a body resembling a nucleus; according to this observer, also, they give off radiated prolongations which often join. Between the spindle cell and the round cell are intermediate shapes.

The same study may be made in the connective tissue derived from the fresh muscle of the thigh or leg of the frog or rabbit; but the cells are less numerous.

4. In the connective tissue of the muscles of mammals, *cylindrical* (walzenformig) cells are sometimes found, containing an elliptical nucleus.

5, Finally, *pigment-cells* are also found in connective tissue, abundantly in amphibia and fishes, but to a limited degree only in man (iris, choroid, and innermost layers of the sclerotic.) These are usually provided with a central nucleus, often obscured, and also exhibit movements, which are, however, exceedingly slow in adult batrachians, but more rapid in their embryos.

Rollett, in Stricker's Histology (New Syd. Soc. translation, p. 57), describes other finely granular cells "which are for the most part more delicate and pale, and frequently exhibit fine radiating strongly refracted striæ of greenish tint. These easily overlooked, delicate, and proportionately large structures may be best distinguished by their very distinct, large, vesicular nuclei." I have had no opportunity of recognizing these cells as special forms.

The addition of very dilute acetic acid, so dilute as to be just appreciably sour to the taste, causes an increased granular appearance in these cells. A stronger solution, say .20, causes a more distinct exhibition of the nuclei, which in the case of the migratory cells are round and smaller, and frequently exceed one in number, while the nuclei of the other connective-tissue cells are *oval* in form and larger in size. The addition of still stronger acetic acid produces shrivelling in the cells, a formation of folds, and extrusion of the nucleus in the case of the wandering cells.

One or more of these cells are met in *two principal varieties* of connective tissue: 1. Trabecular tissue (Balkennetz), adenoid tissue of His, embryonal tissue. 2. Fibrillar connective tissue.

1. The *trabecular connective* tissues are generally characterized by the fact that they do not yield gelatine on boiling. They form net-works of which the trabeculæ were primarily produced by the union of radiating processes of cells. These may preserve their cellular character in retaining the nuclei of the cells, producing thus a nuclear trabecular tissue, or the trabeculæ may so acquire a fibrous constitution as to be undistinguishable from bundles of the fibrillar variety of connective tissue. This variety of connective tissue may occur in independent masses, as in the so-called mucous tissue of the umbilical cord, or it may serve as a means of support, or investment of protection, for fibrillar connective tissue, or vascular (capillary) tissue, or organs, as in the lymph-glands and similar structures, Peyerian and solitary glands, the mucous membrane of the intestines, tonsils and follicles of the tongue, the conjunctiva and its trachoma glands, and the nasal portion of the pharynx. In these latter instances the meshes are filled with the peculiar lymphoid (amœboid) cells described. They are also traversed by blood-vessels, and unite also upon the external surface of the blood-vessels to form the tunica adventitia capillaris of His.

It is this tissue which constitutes the neuroglia of Virchow, the delicate supporting connective tissue of the eye and nervous centres. It also occurs as a constituent of certain pathological new formations. This form of connective tissue is best demonstrated, according to the method of His, by carefully brushing thin sections of the hardened tissue with a camel's-hair brush, by means of which the lymphoid cells are removed, and a delicate net-work is left behind, composed of trabeculæ enclosing round or polygonal spaces: these trabeculæ are sometimes distinctly seen to be composed of nucleated cells or to exhibit nuclei, or, in consequence of age, to have lost all cellular characters.

2. *Fibrillar Connective Tissue.*—Between the trabecular connective tissue or "Balkennetz" and the fibrillar form are intermediate forms; but the great bulk of the connective tissue of the higher animals, at least, is made up of the fibrillar variety.

This—to which alone the term connective tissue was formerly applied—is transformed into gelatine on boiling, and is characterized by the well known fibrous structure implied in the term fibrillar. The cellular elements are those already described, and can only be satisfactorily studied in the young formation of this tissue when quite fresh.

The toughness or close adhesion of many forms of this connective tissue, as in the cornea, sclerotica, tendons, fascia, and even subcutaneous tissue, is well known. It is often so great as to make it impossible to isolate the fibrillæ composing it, without the use of reagents. One of the best of these is *simple lime-water*. A piece of sclerotica or subcutaneous tissue, for example, is thrown into lime-water and allowed to remain for twenty-four hours. At the end of this time a small piece is taken out and frayed with needles. If it stubbornly resists the dissection, it is replaced in the lime-water for another twenty-four hours, when the dissection is repeated. If necessary, the maceration may be continued even longer, when the dissection may be made with surprising facility, and beautiful preparations may be made in which the separate fibrillæ may be clearly displayed. The sclerotic and cornea of the rabbit and the subcutaneous connective tissue from the dog—which is very tough and difficult to fray out—were thus successfully manipulated.

A similar agent is baryta-water, acting more promptly than lime-water and accomplishing the same results in from four to six hours.

A third reagent, which acts similarly, though not so rapidly as the lime-water, is a solution of *bichromate of potash*, of a dark straw-yellow color. The maceration may be continued two or three days, according to the firmness of the tissue, and the solution should be renewed. The fibrillæ are thus rendered easily isolable. The use of this solution is attended by a yellow coloration of the fibrillæ, which may or may not be desirable. This solution was used successfully in the treatment of the adventitia of blood-vessels and in the case of tendons.

The rationale of these processes is not precisely known; though it is usually said that the lime-water and bichromate of potash dissolve a species of cement (Kittsubstanz) by which the fibrillæ are believed to be held together.

Very interesting are the effects of acetic acid and boiling water upon the fibrillar connective tissue. Acetic acid of almost any strength beyond .20, it is well known, removes completely the fibrillar appearance of this form of tissue, rendering it homogeneous, and increasing the width of the bundles, while the cellular element and the cord like fibres of yellow elastic tissue are rendered more distinctly visible. On the other hand, the addition of a little weak solution of ammonia promptly restores the structural characters.

Again, a piece of subcutaneous connective tissue was boiled in water in a test-tube for five or ten minutes. There resulted the same absence of fibrillar appearance, with increased width of the bundles, and constrictions at certain points where the spirally *surrounding* fibrillæ still remain, not permitting the swelling to take place in these situations. Longer boiling dissolves or causes the disappearance of these surrounding fibres also, and if continued still longer causes a solution of the entire mass into gelatine. Tendon was also similarly treated, and with the same results. For these purposes the hot-water stage of Stricker may be used to great advantage.

The staining of connective tissue was attained by two principal staining solutions, *carmine* and *chloride of gold*.

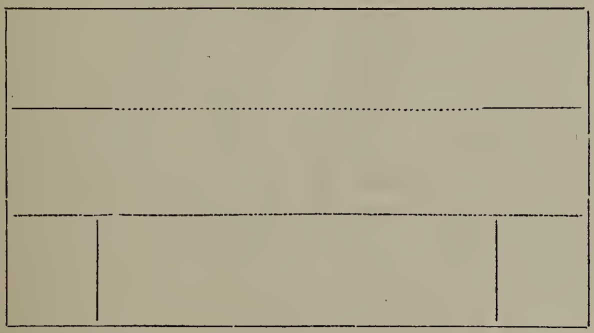
Carmine staining was accomplished by making an ammoniacal solution of carmine, without particular regard to strength, and diluting by water. The tissue was placed in a small quantity of this, and examined from time to time, to determine the degree of staining. When the proper time of immersion for a given fragment was determined, others of the same kind and size were immersed for a corresponding period. In all instances an intensity or vividness was secured by further treating the stained tissue by a very weak solution of acetic acid, of a strength just sufficient to allow the acid to be tasted. This staining is not restricted to any one element of the tissue, but is general, the cells being more deeply tinted than the fibrillæ.

Staining connective tissue with *chloride of gold* has for its object more particularly the demonstration of the cells of the connective tissue, and was thus practised in the case of delicate connective tissue. A piece of the mesentery of a frog is carefully cut out and stretched by means of pins over a fenestra cut in cork. Thus prepared, it is placed in a one-half per cent. solution of chloride of gold for ten minutes, after which it is removed to distilled water slightly acidulated by acetic acid, where it is allowed to remain twenty-four hours, in order that the gold may be reduced and the cells stained. The preparation when taken from the acid should be of a uniformly violet color; it will also be somewhat hardened. It is then examined in glycerin. The different forms of connective-tissue corpuscles should be noted, and care should be taken not to mistake for them the nuclei of clumps of the red corpuscles of the frog, which are apt to be encountered in consequence of section of a blood vessel.

The period of immersion cannot be positively stated: experiment must determine the exact time. Ten minutes is perhaps an average: larger preparations require longer, the more delicate a shorter time.

So far, however, as my own limited experience went, I am not disposed to attribute much utility to the gold staining of connective tissue. The cells only are stained, and that somewhat faintly, and the preparations cannot be mounted to keep any length of time, while the vividness and permanence of carmine stainings, when mounted in glycerin or slightly acid glycerin, are well known.

Making Sections of Tendon and other Tissues.—The imbedding process was always employed; the substance made use of for the purpose being white wax reduced in consistency by oil, the two being melted together. The consistency to be obtained is one approaching that of the tissue to be cut after hardening, while the quantities employed to attain it must be influenced by temperature, the season of the year, etc. The preparation is always previously hardened in alcohol or chromic acid, and in the case of tendon it is sometimes dried, when indeed it may be cut without imbedding, though the change undergone by a specimen thus treated is manifestly great. The process employed is very simple. A little box is made of moderately stiff white paper, and adapted in size to the preparation to be cut. The box is made in the following simple manner: A rectangular piece of paper is folded as indicated by the dotted lines and cut as shown by the plain lines in the diagram; this permits the corners to be turned up and about each other, so that, being pasted in this position, a neat box is formed. The preparation is then taken from the fluid in which it was immersed, (the excess being allowed to evaporate, or removed by bibulous paper,) and perforated towards one end by a pin, which is then thrust into the floor of the box in such a way that the preparation occupies a central position, so that the molten matter may readily flow around it. The mixture of wax and oil is then melted over a spirit-lamp, and allowed to cool until a slight film begins to appear at the edges. It is then poured rapidly around the preparation and allowed to cool. If it is desired that the cooling take place rapidly, it may be placed in water; but, if possible, it should be allowed to cool gradually. After the mass is cool, the paper is stripped off. We then have a rectangular prism, of convenient size to hold between the fingers. This is cut with an ordinary knife until the preparation is reached, when sections are made with a broad, flat knife mounted like a razor, which is much used in Vienna, the imbedded tissue wrapped in a towel being held in one hand and the knife in the other. No precise directions can be given as to the mode of making the sections: experience alone can teach this. It must not be omitted, however, that the knife and upper surface of the preparation should be wetted in each case with alcohol



or water, according to the previous immersion. So also the section is floated off the knife in alcohol or water, according to its previous treatment. It may likewise be stated that it is not necessary to cut entirely through the imbedding substance, but that it is better to start the knife just beyond the edge of the specimen to be cut.

After the sections are made, they may be stained in chloride of gold or carmine or other staining fluid, in the manner described. Or if the tendon is a delicate one, as certain almost thread like tendons of the frog, it may be stained before the sections are made.

Unstriped muscular fibre was studied in the following manner. A section of fresh intestine of the dog or rabbit was taken, washed by shaking about gently in a very weak solution of bichromate of potash, and then placed in a dark straw-yellow solution of bichromate of potash for three days during which the solution should be changed at least once. This loosens the connective-tissue net-work, as well as the net work of muscular tissue, *i. e.*, renders the fibres easily isolable. (Any weak acid, as hydrochloric or a .20 solution of nitric, answers the purpose, but the bichromate of potash solution is better.) The muscular coat is then stripped off quite easily, and small portions dissected in the fluid in which the tissue has been macerating. Very beautiful nucleated muscular fibre-cells may thus be obtained, which possess a yellow tinge in consequence of staining by the bichromate of potash.

Of *reagents* a one-half per cent. solution of chloride of gold renders the cells and their bundles more transparent, and the contours of the fibre-cells are more easily followed. There is no effect on the nucleus. Dilute acetic acid renders the nuclei more distinct.

To stain unstriped muscle.—Very beautiful preparations are made by staining, especially with chloride of gold, muscular membrane—as a portion of the stomach of the rabbit—and making sections of the same, which should be made both parallel and transverse to the length of the muscular fibre. In these and all other instances in which preparations to be stained with chloride of gold require washing, this should be done by shaking it about gently in a much weaker solution of the gold, or, what is cheaper, a very weak solution of tartaric acid. The gold staining is then accomplished as described by mounting the membrane over a fenestra in cork, previous to immersion in the one-half per cent. solution, transferring to acetic acid water, and further hardening in alcohol if the preparation is not sufficiently hard when removed from the acidulated water. The sections are made as before described. It will be easily seen that very different pictures will be obtained in the transverse sections according as they are made through or beyond the nucleus. Beautiful net-works of nerves traversing the muscular lamellæ will also be stained by the chloride of gold. In all cases where sections are not sufficiently transparent, they may be made so by immersing for a few minutes in turpentine, or, better, in oil of cloves, to either of which they must be transferred from alcohol.

Striated muscular fibre was studied in several ways. 1. By maceration for forty-eight hours, more or less, according to the size of the fragments, in a dark reddish-yellow solution of bichromate of potash. It is then dissected with needles and examined. The fasciculi are rendered easily isolable, but are colored somewhat by the bichromate solution, and altogether more altered than by the following methods. 2. Warm small pieces of muscle in a capsule or test-tube containing equal parts of water and one-half per cent. solutions of nitric acid and chlorate of potash, for seven minutes, without boiling. As soon as the fluid begins to vaporize, remove the lamp to a greater distance, but keep up the heat for seven minutes; then transfer to distilled water. The fasciculi become most easily isolable, and may even be shaken apart. The connective tissue is thus dissolved, but less completely than in the next method, and the nuclei of the sarcolemma, as well as of the muscle-substance, are distinctly seen. The latter should be compared with the former. The nuclei in the sarcolemma of muscle are usually smaller than those of the muscular substance, and the latter oftener contain two nucleoli. 3. Boil a fragment of muscle for five minutes in a test-tube, in one part of one-and-a-half per cent. solution of nitric acid, one part of one-and-a-half per cent. solution of chlorate of potash, and ninety-eight parts of water. Place the muscle thus boiled in distilled water twenty-four hours, changing the water once. In this method the connective tissue is completely removed, and even the nuclei of the sarcolemma become invisible.

The distribution of nerves in striated muscle was also studied to a limited extent. This is best studied in animals, in the fresh muscle of those killed by woorara. No special methods were pursued, and many preparations were often examined in the so called indifferent solution—one-half per cent chloride of sodium—before nerves could be detected, and no information with regard to their terminations could be obtained. In the fresh muscle of coleoptera, however, as that of the *hydrophilus piceus*, the termination of nerves in the so-called Doyerian plates (*hugel*,) and the continuation of the sheath of Schwann (tubular membrane) with the sarcolemma of the muscle, were easily demonstrated. The contraction of muscle is also here beautifully shown.

Alimentary Canal.—Very beautiful sections of the alimentary canal of the dog—œsophagus, stomach, and small intestine—were made by first washing the portion in the very weak chromic acid solution alluded to, hardening in the straw-yellow solution of chromic acid for forty-eight hours, transferring to alcohol for two days, and then making sections in the manner described. These may or may not be afterwards stained with carmine. The yellow coloration by the chromic acid serves also to give the different coats a distinctness not obtainod with uncolored preparations. In the case of the small intestine the following layers can be demonstrated with perfect facility. 1. *Epithelium*. 2. *Membrana mucosa*. 3. *Muscularis mucosæ*, or internal muscular coat, composed of two layers,—*a*. circular, *b*. longitudinal. 4. *Submucous connective tissue*. 5. *Muscularis externa*, also composed of two sub-divisions,—*a*. circular, *b*. longitudinal; and finally, 6. *The peritoneum*.

STAINING OF TISSUES.

Gold Staining.—The general method of gold staining has already been given. Certain modifications must of course be made for special tissues and special objects, as demanded by their size or shape or the points to be demonstrated. Thus, in staining corneæ the period of immersion is longer if it be desired to stain the nerve-fibres than if simply to study the so-called corneal corpuscles, and corneæ of rabbits require, of course, longer immersion than those of frogs. For the former an immersion of as much as three-quarters of an hour was permitted for staining the corpuscles, and one and a quarter hour for nerves. For the latter an immersion of from ten minutes to half an hour was allowed before transferring to the acetic acid solution; the former for corpuscles, and the latter for nerves. In either case the epithelial membrane of Descement may or may not be removed by pencilling with a camel's-hair brush, or by careful traction with forceps.

In the case of the rabbit's cornea especially, the stained corneæ may be imbedded and sections made.

Washing is often necessary in order to remove coagula formed by irregular precipitation of the staining substance. This is done by shaking the stained tissue in a test-tube with alcohol, water, turpentine, or other menstruum with which it was last treated.

Again, if it is desired to stain the epithelium and submucous tissue of the intestine of a small animal, as a rabbit, without section of the gut, a portion of the intestine may be filled with the one-half per cent. gold solution, by means of a rubber tube with attached pipette, and allowed to remain thus for ten minutes; then empty and place in the acetic acid solution for twenty-four hours. Further harden, if necessary, in alcohol, imbed, and make sections either of the entire cylinder, or of smaller portions of it, as may be desired.

Beautiful *nerve-preparations* may be made of the tadpole's tail, cutting off a portion, washing in the very weak chloride of gold solution or solution of tartaric acid, staining with the one-half per cent. solution, imbedding, and making sections.

One of the most beautiful manipulations for demonstrating nerves is to fasten a frog on its back, open the abdomen, first inflate the bladder through the common opening of the bladder and rectum, then fill the bladder with the gold solution by means of the rubber tube and attached pipette, allowing it to remain for five minutes, while the exterior of the bladder is kept exposed to a similar solution for the same length of time. Portions may then be cut out and examined in glycerin.

The distribution of nerves in the mucous membrane of the vagina, now claiming considerable attention, is also thus studied. Small portions of mucous membrane are cut out of the vagina of the rabbit, suspended over a fenestra in cork, stained with chloride of gold solution, transferred to acetic acid water for twenty-four hours, and studied in glycerin.

Unfortunately, gold-stained preparations cannot be preserved for any length of time. They are best studied in glycerin, but mounted in this fluid they cannot be relied on for more than a month; though if the cover be cemented by damar lac, they keep even longer. Mounted in oil of cloves, to which they may be transferred from alcohol, and cemented by damar lac, they keep somewhat longer, even a year or more, with little change.

Silver Staining.—It is well known that "silver staining," so-called, has this peculiar action, that it affects, not the cell-substance, but a certain intercellular cement, by which the cells seem united, and that it maps out, therefore, districts of cells by staining their periphery. It has its greatest utility in demonstrating the endothelium of blood vessels, and especially of lymphatics, in serous membranes (centrum tendineum of the diaphragm, pericardium, etc.,) but is also used in cornea staining, in which it marks out the tortuous periphery of the peculiar corneal corpuscles. It is accomplished either by pencilling the organ or tissue of the living animal with a one half or one-fourth per cent. solution of nitrate of silver, repeating once, keeping in the dark for ten minutes, and then placing in distilled water for twenty four hours, renewing the water once; or, secondly, by removing the organ either from the living or recently killed animal, immersing in the silver solution in the dark for from one to ten minutes, and transferring to distilled water for twenty-four hours. In all instances the epithelium must be previously removed from the tissue or organ to be stained; which is very easily done by the simple friction of a camel's-hair brush, or by wiping the epithelial surface with a dry cloth. The most successful preparations of this kind I have ever seen were made from the central tendineum of the recently killed rabbit, by Dr. Klein, at the Brown Institution, London. The demonstration of the lymphatics and lymph spaces was perfect. The preparations are best examined in glycerin, in which they may be preserved for a short time. Nitrate of silver injections of small blood-vessels, as those of the kidney of a rabbit, are also made by means of delicate glass pipettes connected by an India-rubber tube with the syringe carrying the one half per cent. solution. The manipulation is delicate.

Preserving specimens.—The favorite menstruum at present used in Vienna for mounting all preparations, except the silver and gold stained tissues, is the *damar lac*. To this, preparations are directly transferred from turpentine or oil of cloves, the excess of these being removed by momentary contact with bibulous paper, covered, and allowed to dry; the excess of damar at the edge of the preparation answering at once for cement and wall of the cell. Preparations which have been previously surrounded by watery solutions or glycerin must of course be washed in alcohol before they can be placed in turpentine or oil of cloves; nor can preparations be directly transferred from alcohol to damar lac, but must first pass through turpentine or oil of cloves. For preparations previously immersed in aqueous menstrua, which do not admit of transfer to alcohol, and thence to turpentine or oil of cloves, glycerin is used, and the cover cemented with the damar lac.

Oil of cloves is also much used for mounting, and is the favorite medium for making sections transparent which are not sufficiently so. For this purpose it is more satisfactory than turpentine. An immersion of from a few seconds to several hours is permitted, and sections may remain in the oil of cloves until mounted in damar.—*Philadelphia Medical Times,* Nov. 30th and Dec. 14th, 1872.

INDIAN MODE OF CASTING DELICATE OBJECTS IN METAL.

Many of the ornaments brought from India are cast in a very delicate and refined manner. Those curious to know how they are made will gain some information from the following extract, communicated to the *English Mechanic* over the signature "Eos:"

The goldsmiths and silver-workers always prefer the curious clay compound prepared by the white ants, and taken out of their huge honeycomb abodes, for forming the tiny crucibles used in their arts; it burns beautifully, without cracking, when taken from a proper locality, but is more frequently found as here—in Jubbulpoor—full of grit, and too friable, after repeated washings, to hold together. The stomachs of these "white ants" are evidently supplied with a powerful chemical secretion; and this, doubtless combining with certain clays and earths, constitutes the useful crucible product I now speak of. It burns to a hard white vessel, on which the borax of the artizan gives a brilliant internal glaze; but I have never seen this earth used for any but the diminutive melting-pots alluded to. White ants, if they "swarm" or "lodge" for a short time on sheet-glass, corrode the same in zigzag patterns, as if etched by fluoric acid; occasionally these marks resemble Persian characters or Egyptian hieroglyphics. Hence, some potent chemical acid enters into their building composition, of which the tenacity in some countries, when it has been well kneaded, pounded, and sun-dried, renders it a fine, cheap flooring for settlers' houses. It is very generally used in South Africa, where I employed it for the upper portion of a rough stone floor to my veranda.

But I must return to my artistic Indians and their primitive "dodges." In casting small articles in brass and the cheaper metals, they fix the mould with iron wire to the mouth of the melting pot, well luting the connections repeatedly with a mixture of stiff clay and cow-dung, kneaded together till quite strong and safe, gradually warming the luting at the mouth of the furnace, and repairing all cracks and fissures as they may appear; when thoroughly dry, the whole mass is put in the rude native furnace of common clay; and on the contents of the melting-pot being fused, it is turned gently "topsy turvy," and the metal runs from its inverted mouth into the attached mould. For articles of ornament and elaborate design, of any size, even to a field-piece, the native workman makes a composition of two parts of "dammer" resin and one part beeswax (common resin will replace the first in England); these are very slowly and carefully melted over charcoal, and stirred together (in the open air, and not under a roof), and when almost hard are moulded by the hands, the lathe, or in metallic shapes. These models, in their turn, are then encased in suitable mould clay, and very carefully and slowly dried in a shady spot until perfectly hard and seasoned. The workman then, over charcoal, gently heats the mould and pours out the composition from the hole he left as a future "ingate;" when every particle of the mixture has flowed out into a vessel held to catch it for future use, he increases his fire till smoke rises from the interior of his mould, and it is gradually brought to a condition to receive the molten metal. From an ear-ring to an idol, this is the favorite *modus operandi* of casting, and I can most thoroughly recommend it to the ingenious amateur, if he be not already practising it. Bismuth is so very highly priced in India that I never employ "fusible metal;" the present mode, besides, being cheaper, gives a sharper casting, especially for small jewelry and tiny silver ornaments, to say nothing of avoiding the contamination of precious metals by the lead of the alloy.

There is great reason for supposing that in the days of "human sacrifices" models of the entire figure were obtained by casts of the victims who were immolated, in substantial clay coverings, which, when red hot, were filled with molten gold or silver, and gave the perfect images required by the priesthood. The delicate German castings of flowers and insects are now-a days cast in the same fashion—"burning out." Fish and reptiles, such as snakes and lizards, may be so cast very life-like in tin, and afterwards bronzed. I lately amused myself by getting the perfect nature model of a water-snake. about two feet long, in the above manner. I got a split bâmboo, equally divided; I placed good fire clay in each half of this bamboo; I then put the snake carefully between the two pieces, secured the halves of bamboo firmly by binding wire at intervals of a few inches; I dried the whole slowly before a fire; I then slowly, in a long charcoal stove of clay, gradually burnt out the snake, and poured in pewterer's solder—that is, two parts tin, one part lead.

I have a small box in "ormolu," of foreign manufacture, surmounted by a "horned beetle," evidently modelled in this fashion, which I recommend to the amateur mechanic as a most satisfactory and interesting amusement.

HYPODERMIC INJECTIONS.

BY M. ADRIAN.

In the preparation of a solution for hypodermic injection, the choice between the normal alkaloid and its salts is not an indifferent one. When medicaments so powerfully active are injected under the skin, it appears necessary to define clearly the relation that exists between the alkaloid itself and its combinations with acids. In medical practice sufficient importance is not always attached to this distinction; and instances are sometimes met with where the same doses of hydrochlorate, sulphate, and acetate of morphia, or of hydrochlorate and sulphate of strychnia are prescribed, although the constitution of these various salts assigns to them a sensibly different proportion of the active principle that is employed. This will be seen by an examination of the following numbers:

One gramme of	Crystallized alkaloid.	Water necessary for solution.
Hydrochlorate of morphia contains	0.80	20
Sulphate of morphia	0.76	10
Acetate of morphia	0.86	5
Sulphate of strychnia	0.75	10
Hydrochlorate of strychnia	0.83	8

According to this table one gramme of acetate of morphia contains ten centigrammes more of morphia than the same weight of the sulphate; and a similar difference exists between the hydrochlorate and sulphate of strychnia.

Of course it is because of their greater solubility in water that the preference is given to the saline combinations over the alkaloids. But the preparation of these solutions is not so easy as at first sight might appear, and certain difficulties are met with in the operation which might possibly lead to a notable error in the final result, and so modify consequently the composition of the medicament. Thus, in operating with the salts of morphia, it is found that their solubility is variable, and it is necessary sometimes to have recourse to elevation of temperature or the addition of a fresh quantity of acid to obtain a solution. This difference may arise from an impurity in the salt, or, more frequently, from the greater or less amount of dehydration it has undergone in its preparation. On the other hand, it is rarely that the solution is sufficiently clear, and it becomes necessary to filter it through paper. But what then happens? The filter absorbs a portion of the liquid; and although the precaution may be taken of well washing the filter, there is no proof that the whole of the active principle is carried off in the washing, so that in pouring 10 grammes of distilled water, containing 30 centigrammes of hydrochlorate of morphia, upon a filter weighing 50 centigrammes, only 8.20 grammes of the solution is recovered—being a loss of 1.80 gramme, or nearly one-fifth.

Solutions intended for hypodermic injection, prepared as they usually are, present another defect, namely, the alteration which they undergo after a time. Small fungi are seen to form upon their surface; then the liquid becomes turbid, and gives rise to a copious deposit. The experiments which the author has made with the object of avoiding this alteration, have led to the following results:—

The solutions of atropia and codeia are decomposed more readily than the others. Also, when they are prepared in the cold they change more rapidly than when they are obtained with boiling water. Liquids containing the alkaloids, dissolved with the help of sulphuric acid, are preserved better than those in which hydrochloric acid is used. Finally, solutions containing glycerine to the extent of one-fifth of the total volume may be kept for a long time without undergoing the least alteration.

Based upon these observations, the author has been led to consider the following conditions to be desirable in the preparation of solutions for hypodermic injections.

(1.) To use exclusively alkaloids of vegetable origin in a state of purity. These are always well defined, stable and uniform in composition, whilst their salts vary according to the equivalent of the acid which is used in their formation, and according, also, as they contain more or less water of crystallization.

(2.) To use as a vehicle boiled distilled water, containing twenty per cent. of glycerine.

(3.) To give the preference to sulphuric acid, diluted in the proportion of one of acid to ten of water, above all other acids.

(4.) To substitute measurement by volume for measurement by weight.

Mode of Operation.—After having verified the purity of the alkaloid, reduce it to powder, and weigh a quantity corresponding to a determined volume. Place the powder carefully in a graduated flask holding 10, 20, 50, or 100 cubic centimetres. After having added some drops of glycerined water to suspend the powder, the acid is poured in of the strength indicated above. The solution may be made cold, but more often it is necessary to raise the temperature a little in order to accomplish it. When the solution has cooled it must be made up to the necessary volume with the glycerined water. Solutions may be prepared by these simple means that will be clear and of uniform composition, and have the advantage of keeping a long time without alteration. This result having been recognized, it remains only to indicate a formula which will enable the medical man to know the quantity of alkaloid contained in the solution, so that he may vary the dose at his will. The following proportions appear to the author to be the most suitable:

Morphia, ...	1 grm.
Sulphuric acid, ...	2.50 grms.
Distilled water, containing twenty per cent. of glycerine, ...	q. s. to make 100 c. c.

If the syringe be gauged to one centimetre, and it require twenty half turns to empty it, then each half turn will equal one-half of a milligramme. By augmenting the proportion of the morphia and that of the acid, without changing the total volume, solutions, containing one to two milligrammes to the half turn, may easily be obtained. If necessary, the quantity may be increased to ten grammes to the hundred cubic centimetres; but when the solutions are too concentrated they crystallize, and the composition of the liquid is thus modified.

The formula for codeia is as follows:

Crystallized codeia, ...	1 grm.
Sulphuric acid (10 per cent.), ...	1.50 "
Distilled water, containing twenty per cent. of glycerine, ...	q. s. to make 100 c. c.

Each half turn of a syringe gauged to one cubic centimetre will correspond to half a milligramme.

The other alkaloids may be treated in a similar manner.

The following are the approximative quantities of sulphuric acid required to dissolve one gramme of the substances named:

Alkaloids.	Acids.
Aconitine (Duquesnel),	1 grm.
Atropia,	2 50 grms.
Narceia,	7.50 "
Strychnia,	2 50 "
Veratria,	2.50 "

The author gives the following formula for the preparation of hypodermic injections of the crystallized digitaline of M. Nativelle, although he does not think that digitaline should be used in this manner, since it causes intense irritation:

Crystallized digitaline,	1 centigr.
Alcohol (95 per cent),	5 cub. cent.
Dissolve and add	
Distilled water,	5 cub. cent.

One cubic centimetre will contain one milligramme of crystallized digitaline; by dissolving two centigrammes of digitaline, each cubic centimetre will contain two millimetres.—*Bulletin Therapeutique.*

CARBOLIC ACID AND CREASOTE.

BY PROFESSOR FLÜCKIGER, BERN.

A good plan for distinguishing these two substances is, as follows:—

			Parts.
Take	*a.*	Solution of perchloride of iron, about 1.34 spec. gr.	1
	b.	Creasote, that is to say, the liquid to be tested for creasote,	9
	c.	Alcohol, containing about 85 per cent. of absolute alcohol,	5
	d.	Water,	60

Now $a+b$ mixed assume no peculiar color.

$a+b+c$ furnish a green solution.

$a+b+c+d$ form a turbid mixture of a dingy, brownish color, drops of creasote being separated.

On the other hand, in the case of carbolic acid, suppose likewise:—

a.	The above ferric solution, weighing equally,	1
β.	Carbolic acid, (phenol,)	9
γ.	Spirit of wine, as above,	5
δ.	Water,	60

Now $a+\beta$ will show a yellowish hue.

$a+\beta+\gamma$ yield a clear brown liquid.

$a+\beta+\gamma+\delta$ display a beautiful permanently blue solution, without separation of carbolic acid, or the few drops sinking down may be redissolved by shaking.

Mr. Th. Morson pointed out that glycerin is also a good test for the purpose under notice, creasote being not or almost not soluble in that liquid, whereas, as it is well-known, carbolic acid readily mixes in all proportions with glycerin. This notice, however, requires, I beg to observe, a slight modification. True creasote, which stands the above test, is perfectly miscible in any proportion with anhydrous or nearly anhydrous glycerin, but it is not so with a somewhat diluted glycerin; a clear solution of creasote and of the same weight of anhydrous glycerin becomes turbid on addition of a little water, whereas a similar solution of carbolic acid may be diluted with water without separation of carbolic acid.*

The blue coloration of carbolic acid, due to perchloride of iron, enables us to discover it when mixed with creasote, but not to prove the presence of creasote in carbolic acid. The latter question, however, seems to me of less practical importance; yet, creasote, if present to some extent, would quickly separate in the above process, $a+b+c+d$, if more water be added. For this purpose the addition of perchloride of iron would be useless.—*Pharm. Journ. and Trans.*, June 15, 1872.

SUPERHEATED WATER.

Water in its ordinary state holds in solution a considerable quantity of atmospheric air, which, it is now well known, exercises an influence on the process of evaporation. This air may be expelled by boiling the water, or more perfectly by freezing. In passing from the liquid to a solid state the air is more effectually expelled than is possible by even long continued ebullition. If water, from which air has been thus expelled, be heated, steam seems to be retained in place of the air, and to be held by the attraction of the water with a force which can only be overcome by a considerable expansive effort of the steam.

Professor Tyndall demonstrates this by a very simple and very beautiful experiment:

A quantity of ice is placed in a receptacle suitable for heating, and oil enough poured in to submerge the ice. The receptacle is then heated, the ice melts, the water formed is constantly covered by the oil floating upon the surface, and, being thus protected from the atmosphere, can receive no air whatever. A bell shaped glass cover is placed over the receptacle to prevent the oil from being unpleasantly scattered about by the action which follows, and th water is heated until it boils. But instead of boiling as water ordinarily does—the steam rising continuously in bubbles from the heated bottom to the surface—the water from which the air has been expelled retains the steam until the heat and consequent tension is sufficient to overcome the attraction of the water. When this point is reached, the steam escapes with an explosion, scattering the oil and water in all directions. That this action cannot be due to the oil upon the surface is demonstrated by the fact that in a similar receptacle, water from which the air has not been expelled, covered with oil in the same manner as the preceding, boils tranquilly as usual. In the latter vessel conversion into steam commences at 212°, which corresponds to the temperature of steam at a pressure of 15 lbs. per square inch; while in the former, in addition to the atmospheric pressure, the attractive force of the water holds the steam compressed until an explosion relieves it; the water settles back and remains quiet until the tension is again produced, and so on, the water being converted into steam in a series of explosions.

In an ordinary boiler, and under ordinary conditions, the temperature of the water and of the steam over it is always accompanied by a certain pressure; but as steam, when removed from contact with water, may be heated to a temperature indefinitely above that corresponding to its pressure, so water in the condition which we have described, being heated considerably above the temperature corresponding to the pressure of the steam over it, may be properly called *superheated*.

To what extent this superheating of water may be connected with boiler explosions is somewhat problematical; but it is evident that if water from which air has been expelled may be many degrees superheated, the steam contained in the water in place of the expelled air, being at a much higher temperature and pressure than the steam above the water, the pressure and water gauges are not always reliable indicators of the condition of the water in the boiler.—*American Artizan.*

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* The glycerin employed by Mr. Morson was the ordinary distilled glycerin of commerce, and he considers the advantage of the test suggested by him to consist in its simplicity and easy application.—Ed. Pharm. Journ.

DETECTION OF BLOOD-STAINS.

Dr. Edward S. Wood reports that *Fres. Zeitsch. f. Anal. Chem.* (1872, ii. p. 244) contains a note from Dr. Helwig, contradicting a statement made in the *Chem. Centralb.*, 1871, p. 37, that a solution of blood-pigment in iodide of potassium cannot be used for the production of blood-crystals, but only for spectroscopic examinations. It has long been known that a solution of iodide of potassium will extract from clothing the slightest trace of blood coloring matter, it being possible to obtain a solution suitable for testing even when the clothing has been washed and the stain is very old. In the present instance Dr. Helwig exhibited a specimen of hæmin-crystals which he had obtained by treating a piece of linen upon which a blood stain had existed for sixteen years, with a solution of iodide of potassium. The residue left after the evaporation of one drop upon a glass slide gave beautiful hæmin-crystals upon the application of Teichmann's test, when the remainder of the solution, examined by the spectroscope, gave an absolutely negative result.

Teichmann's test, the ordinary test for hæmin-crystals, is performed by rubbing upon the dried residue in a watch-glass or on a microscope slide a very small quantity of ammonic chloride or common salt, adding to the mixture a drop of glacial acetic acid, and warming until bubbles form under the covering glass, showing that the boiling-point of the acetic acid has been reached. Upon cooling, crystals of hæmin can be detected by the microscope.

In the same journal (1872, i. p. 29) we find mentioned by H. Struve an additional test for blood pigment, which is applicable to the testing of both urine and clothing-stains for blood. This test is based upon the precipitation of hæmatin from an acetic acid solution by tannic acid as tannate of hæmatin, and may be performed in the following way. To the urine or any other liquid suspected to contain hæmatin is added a little ammonia-water or potassic hydrate, then a solution of tannic acid, and finally acetic acid, to distinctly acid reaction. If hæmatin be present, a reddish-brown precipitate, tannate of hæmatin, is formed, which quickly settles and can be very easily washed and collected on a filter. This precipitate, after drying, gives a residue with which we can obtain hæmin-crystals by performing Teichmann's test. This test is far superior to Heller's test for blood in the urine, in which the hæmatin is mechanically carried down with the earthy phosphates, after the addition of ammoniac or potassic hydrate. By the above method the author claims to have detected the presence of blood when all other reactions have failed: for instance, in urine when he could not detect the albumen by any of the ordinary tests. In 20 cc. of urine to which 0.023 per cent. of blood was added, a precipitate was obtained which permitted numerous examinations for hæmin-crystals to be made by Teichmann's test.

The same author (*Fres. Zeitsch.*, 1872, ii. p. 150) states that he has separated from the blood two new coloring-matters. One is soluble in alcohol and water, difficultly soluble in ether, and forms, when dry, a dark greenish-brown mass which chars without puffing up, and, after ignition, leaves a residue, consisting of oxide of iron, phosphoric acid, and silica. It is precipitated from its solution in water by acids, and the application of Teichmann's test does not yield hæmin-crystals. The other pigment separates in the form of dark bluish-black microscopic crystals, reminding one of indigo. These crystals are insoluble in water, alcohol, ether, chloroform, and acids, but are soluble in alkalies with the production of a dark-brown solution. If precipitated from the alkaline solution by acetic acid, and the precipitate subjected to Teichmann's test, the result is the most beautiful hæmin-crystals. Concentrated sulphuric and nitric acids dissolve this pigment with a greenish-yellow color, concentrated hydrochloric acid and aqua regia decompose it, and glacial acetic acid is without action upon it, unless ammoniac chloride has been previously added, in which case it dissolves it, forming a dark-brown solution, which, upon evaporation, yields large pure hæmin-crystals. After ignition, the residue consists of pure oxide of iron. These crystals he considers to be identical with Virchow's hæmatoidon. An elementary analysis of these pigments is promised.—*Phila. Med. Times*, Jan. 18, 1873, from *Boston Med. and Surg. Journ.*, Jan. 2.

TO CUT AND BORE INDIA-RUBBER CORKS.

BY W. F. DONKIN.

Dip the knife or cork-borer in solution of caustic potash or soda. The strength is of very little consequence, but it should not be weaker than the ordinary reagent solution. Alcohol is generally recommended, and it works well until it evaporates, which is generally long before the cork is cut or bored through, and more has to be applied; water acts just as well as alcohol, and lasts longer. When, however, a tolerably sharp knife is moistened with soda-lye, it goes through India-rubber quite as easily as through common cork; and the same may be said of a cork-borer, of whatever size. I have frequently bored inch holes in large caoutchouc stoppers, perfectly smooth and cylindrical, by this method. In order to finish the hole without the usual contraction of its diameter, the stopper should be held firmly against a flat surface of common cork till the borer passes into the latter.—*Chem. News*, Lond., Aug. 30, 1872.

IRON IN THE BLOOD.

Boussingault finds the amount of metallic iron in aliments as follows: The minimum in carrots, 0.0009 gram.; the maximum in the blood of hogs, 0.0534; in beer, .0040. In vertebrates, the quantity of iron does not exceed a thousandth of the weight; in invertebrates, probably not four ten-thousandths. It is usual to attribute the red color of the blood to the presence of iron. Yet the white blood of invertebrates contains almost as much iron as the red of vertebrates. Also, plants, not green, like mushrooms, contain almost as much iron as the green plants. Boussingault concludes that of all substances the blood is that which contains the largest amount of iron, and of assimilable iron, since it has already been assimilated.—*Boston Med. and Surg. Journal*, Jan. 2, 1873, from *Medical Press and Circular*.

POISONOUS PAPER SHADES.

Dr. Mirus mentions two cases in Jena and one in Frankfort where persons using green glazed paper shades were attacked with symptoms of arsenic poisoning. In one case the symptoms did not cease until the use of the shade was discontinued. The heat of the lamp, volatilizing the arsenic, renders even the very small quantity present extremely dangerous. The arsenic is used in the well known Paris green, with which not only lamp shades, but wall papers, &c., are so often colored.—*Boston Med. and Surg. Journal*, Jan. 2.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY,

S. E. corner Arch & Tenth Sts., Philadelphia.

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SUSPENSION OF THE DENTAL TIMES.

At a recent meeting of the Faculty it was decided to suspend, for the present at least, the publication of the "TIMES," with the issue of this number, which completes Vol. X. The "TIMES," which is, therefore, just ten years old, was started at a period when the formation of energetic rival schools, and the editorial relations held by the management of some of them, required that our college should have an "organ." This necessity seems now no longer to exist, and the Faculty have deemed that they may now, without detriment to the interests of the school, relinquish the onerous duties of editors and publishers—how onerous, they only know who have actually encountered them.

A few subscribers have paid in advance for Vol. XI; to these the amount of their subscriptions will be returned. So also a *pro rata* return will be made to such advertisers who have not received the amount of advertising for which they have paid.

THE

DENTAL TIMES.

VOL. X. PHILADELPHIA, APRIL, 1873. No. 4.

Original Communications.

CLASSIFICATION OF OBJECTS OF NATURE AND THEIR DISTINCTIVE CHARACTERS.

AN INTRODUCTION TO THE STUDY OF PHYSIOLOGY.

BY JAMES TYSON, M. D.

One of the earliest lessons taught by even the most superficial observation of nature, is the division of her objects into two great classes, commonly known as the *living* and the *dead*, but more accurately as the *organized* and *unorganized.* In the former are included objects living, or which, if dead, still retain an organized or structured form; in the latter, objects which, being without differentiated structure, are homogeneous, and have never as such been endowed with the property known as life—in a word, *minerals.*

Numerous attempts have been made by physiologists and others, accurately, and at the same time briefly, to define these divisions of nature, but most of the definitions thus proposed, though seeming at the time sufficiently accurate, have proven to be faulty as our knowledge of nature has extended. Thus the long accepted definition that an organized structure is a structure possessed of organs, each of which is characterized by a special function, fails us in the light of Prof. Haeckel's* discovery of the *monera,* (μονηρης, simple,) the simplest living organism, structureless, jelly-like, and possessed of no semblance of an organ, not even a nucleus. We are compelled, therefore, to look for some other constant characteristics, and for the present, at least, may accept the following definition as including that which is most essential: *An organized structure or an "organism" is a structure possessed of the essential life functions of* REPRODUCTION, NUTRITION, INTERSTITIAL GROWTH and DEVELOPMENT, while an unorganized structure possesses none of these, its growth being such as depends upon external accretion alone.

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* Ernst Haeckel, "Generelle Morphologie der Organismen," Zwei Banden, Berlin, 1866; and "Monographie der Moneren" in "Jenaische Zeitschrift fur Medicin und Naturwissenschaft," Band IV., Heft 1, Mai. 1868; the latter translated by Prof. E. Percival Wright, M. D., of Dublin, in the Quart. Journ. Microscop. Sci. Vol. IX., N. S., 1869.

Each of these divisions possesses certain other distinctive characters, and although a knowledge of many of them is implied in the rapidity with which even a child will rightly locate an object belonging to either class, yet others are not at once palpable to ordinary observation, while there is evident advantage to the student in a systematic statement of all. Accordingly we append briefly such an enumeration of these differences:

1. *Organized structures usually, at least, are derived from a parent*—we say usually, in order that even if the exceptional instances claimed of a spontaneous generation of the lowest forms of animal and vegetable life be admitted, our proposition may be nevertheless true: while we do not hesitate to declare for ourselves that we are not satisfied with the proofs adduced by the school of Pouchet and Charlton Bastian that even such low forms originate *de novo* and do not descend from a parent. Unorganized structures have no such origin.

2. Although the most recent studies in morphology no longer permit a differentiation of the structure of all organized bodies into organs, yet in all but the simplest forms of animal and vegetable life such differentiation exists, and the *higher forms* of *animal and vegetable life* are further characterized by the *possession of organs*, which are endowed with certain uses or *functions*, the sum of which constitutes the life of the individual. The animals in which there is the greatest number and dissimilarity of the organs constituting them, and a consequent adaptation to a great variety of purposes, are said to be more *highly organized* than the lower forms of life.

3. *Organized structures have a definite duration of existence.* It is well known that organized structures die at the end of a certain period, however different it may be for different species and individuals of the same species, and that sooner or later after death a more or less complete disintegration of their structured parts and a conversion of them into unorganized or mineral matter takes place. On the other hand unorganized objects will exist perpetually so long as no extraneous destructive forces are brought to bear upon them.

4. *Organized structures are characterized by peculiarities of shape*, being usually rounded or convex on their exterior, while unorganized structures are either indeterminate in shape, or are bounded by straight lines and angles, the latter condition being due to the property of crys-

tallization which is possessed to a greater or less degree by all unorganized substances when placed under certain conditions, while the former indeterminate shape results in the absence of those conditions. Organized structures possess, moreover, a shape more or less determinate for every species or race, which, although subject to variation for the individual, is still limited by the condition of a rounded contour.

5. *The organized structure is usually restricted in the size* which it attains. To this there are certain exceptions, which, however, must be conceded to be real exceptions and not apparent as sometimes stated. Thus there is no limit to the growth of the tree, which continues to increase in size as long as it lives, and although much of that growth consists in the repetition of parts, as buds or leaves, which are more or less capable of independent existence, and are themselves limited in the size they attain, yet this cannot be said of the trunk and branches, which continue to increase in size by the addition of new elementary parts precisely as the organs and entire body of man and other animals increase. So also with the coral polyp, the growth of which seems to be quite unlimited. On the other hand we may admit as exceptions the instances of certain sea weeds, in which an unlimited length seems to be attained by the multiplication of fronds which are not only precise repetitions of each other but which also grow independently of each other and the parent stalk, neither receiving from nor communicating to any other part the materials of their organic structure. Such multiplication of similar parts is termed *nutritive or vegetative repetition.* The admission of exceptions, however, serves perhaps to intensify the rule.

6. *Organized structures grow by interstitial deposit, unorganized by accretion.* It is well known that in the growth of organized bodies there is no visible exterior deposit of new matter, and yet the evident increase of size involves the addition of some new material. We conclude, therefore, that it is internal and interstitial—between the elementary parts previously existing. In the case of the growing crystal, however, we are aware of an actual deposition of new matter on its outside, and that its increase in size is due to such deposition.

7. *Organized substances are heterogeneous in their structure and appearance; unorganized are homogeneous or alike throughout.* For while a section through a block of marble exhibits a uniformly similar surface and composition, a section through any organized body, as a human being or the trunk of a tree, furnishes a varied composition and aspect in its different parts. And while the great contrast in this respect becomes less marked as we compare the lower forms and the minute elements which make up the tissues of the animal and vegetable kingdom with the inorganic, the general truth of the proposition remains the same.

8. *Organized structures are complex in their composition, unorganized are simple.*—Thus, although the same elements enter into the ultimate structure of each, the organized body containing solid and fluid constituents, is in the first place made up of a certain number of organic substances themselves compound but next to ultimate in their simplicity, and therefore called *proximate principles.* These are at least ternary in their composition and many times contain five and six elements, while the number of atoms of each element is very large; thus the percentage composition of albumen one of these proximate principles is $C_{53\ 5}H_7N_{15.5}O_{22\ 4}S_{1.6}$, in which the large number of elements and the proportion of atoms are apparent. Unorganized substances, on the other hand, either contain one or two elements of which the number of atoms is small, as seen in iron ore (F_eO), and water (H_2O), and when more than two enter into their composition the same fact holds with regard to the number of equivalents of each element. Thus ammonium carbonate NH_4HCO_3 contains four elements, but the small number of each contrasts strongly with that of the same elements in albumen. Potash alum, or aluminium potassium sulphate ($Al_2K_2 4 SO_4 + 24 H_2O$) furnishes an example, in which even five elements enter, but the same truth holds with respect to the number of equivalents of each. It may be added that vegetable tissues are intermediate between the animal and inorganic in these peculiarities.

9. *Organized structures are constantly changing the elements of their composition.* That is, although always composed of oxygen, hydrogen, nitrogen, carbon and a few additional elements, these are constantly being removed in the processes of nutrition, while new atoms of the same elements are put down in the places of those removed. Thus, therefore, the composition is constantly varying, while in the case of alum, just alluded to, the same atoms of potassium, oxygen, sulphur, aluminium and hydrogen which enter into its formation in the first instance, remain there so long as it continues to maintain its physical and chemical characters as alum.

10. *Organized structures may be decomposed but not recomposed, while unorganized bodies may be recomposed as well as decomposed.*—It is well known that organized structures can be resolved in the laboratory, first into their proximate constituents—albumen, fibrin, musculin, &c. for the animal kingdom, and lignin, starch, &c. for the vegetable, and that these again are capable of being reduced to the simple elements of which they are composed; but no chemist has ever taken these elements and, reuniting them, produced the organized structure from which they may be derived. It is true that in the rapid progress that has of late years been made in organic chemistry, substances of an organic nature have been

produced in the laboratory which were at one time considered beyond the powers of the synthesist. Urea is one of these, and there are those who are sanguine that even more complex substances, as albumen and fibrin, may be built up from simple elements. But the most that can be said of these is that they are *organic* substances, not *organized structures.* An *organic* body is something quite distinct from an *organized* body, and may be defined as *a substance resulting from the proximate analysis* of an organized body. Thus urea, albumen, musculin, lignin and starch are organic bodies, but not organized structures, and with this distinction borne in mind no one will claim that organized bodies have been, or are likely to be produced in the laboratory of the chemist. No distinction, however, is made between an *inorganic* and an *unorganized* body—the terms are strictly synonymous. It is further true of these organized bodies, that although capable of analysis into ultimate elements, yet the process is one of comparative difficulty as compared with minerals. Thus it has been found that in an analysis even of the proximate principles albumen and fibrin not only are the results of different analysts different, but even two analyses of the same observer furnish different results as to the number of equivalents of the elements constituting them; and it is only by taking an average of a large number of analyses that the organic chemist arrives at what he considers a correct knowledge of the substance investigated. For example, Gorup Besanez, an eminent organic chemist, makes the composition of albumen $C_{53.5}H_{7}N_{15.5}O_{22.4}S_{1.6}$, while Hoppe Seyler, equally eminent in this department of chemistry, announces it as $C_{52.7\text{ to }54.5}$, $H_{6.9\text{ to }7.3}$, $N_{15.4\text{ to }16.5}$, $O_{20.9\text{ to }23.5}$, $S_{0.8\text{ to }1.6}$. Now since this is true of the proximate principles constituting an organized structure, much more is it the case with regard to the organized structure itself, made up of a number and variety of these.

11. *Organized structures are soft and yielding in their consistency, on account of the admixture of fluid elements which always enter to a greater or less degree in their composition; while inorganic bodies are hard and resisting*, a fact which scarcely requires illustration. There are, however, certain apparent exceptions to the first statement, which call for a moment's attention. Thus we have in the stones of fruits, the teeth and the carapaces of insects and certain crustacea, as crabs and lobsters, structures which are considered organized, but nevertheless exceedingly hard. But in these instances this condition is the result of a later deposit of inorganic matter in a frame work of organized substance, which was in the first instance soft and sometimes even jelly-like in consistence, while the inorganic body is hard from the beginning. Moreover, when an organized structure becomes thus altered, it ceases to possess many of the physiological

properties which in their union constitute vital operations, and becomes more allied to inorganic matter. It is, however, still organized matter, with a comparatively small amount of animal basis.

12. *Organized structures have a reproductive and conservative power*, as evidenced first in the preservation of the species by the well known function of generation, and second, in the power of repairing injury and recovery from disease, possessed by them in varying degrees. Although this power of repair is evident in the highest forms of animal life, yet the degree in which it is possessed is much more marked in the lower ranks of the animal and vegetable kingdoms. Thus it is well known that the tail of a tad-pole or newt, or the toe of a frog may be cut off and in the course of time will be renewed; no such degree of power is possessed by the higher animals, yet the ability to repair injuries of less degree, possessed by these animals is too well known to require illustration.

13. *Organized structures appropriate and convert into their own tissue material unlike themselves.*—The power by which living forms of the vegetable, as well as of the animal world, appropriate food, elaborate it, and however much unlike their own structure it may primarily be, convert it ultimately into the material of such structure, is possessed by organized bodies alone. These phenomena constituting in their entirety the function of *nutrition* are in no way repeated in the unorganized world; for whatever size an inorganic mass may attain it can only grow by the addition of material of its own kind, and never has it happened, for example, that a crystal of sodium sulphate has increased in size when placed in a solution of potassium carbonate by a conversion of this material into its own substance.

From the possession of this property results the growth or *increase in size* of the organized structure, its *development* or passage into a higher state without necessary increase of bulk, and finally the *continuation* of its individuality through a constant supply of new material to take the place of the old, which is as constantly disintegrating.

From a careful survey of these general characteristics, it will not be difficult to select the cardinal characters already named in our definition of an organized body—reproduction, nutrition, *interstitial* growth and development. For of growth it may be said, that although unorganized or inorganic bodies grow by external deposit, the mode of interstitial growth peculiar to organized structures is sufficiently distinctive to be considered cardinal. So with regard to development, there is no organized body so simple that it does not at one period of existence pass from a lower to a higher state. Enough has already been said of reproduction and nutrition to cause them to be admitted as peculiarly distinctive.

REPORT OF A CASE OF TRISMUS, FOLLOWING A COMPOUND FILLING OF TIN AND GOLD.

BY F. D. CLUM, STUDENT IN THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

Five or six weeks since a dental practitioner was consulted by a lady, perhaps eighteen years of age. She had a cavity in her superior anterior bicuspid, involving portions of the labial anterior and masticating surfaces,—the greatest portion, however, being on the labial surface (after properly excavating;) the pulp was not exposed, there being a thin septum of dentine between it and the proposed filling. The lady stated she was not able to pay for a gold filling, and yet she wished it to have the appearance of gold; she was then informed that a tin filling could be inserted, to occupy, perhaps, three-fourths of the cavity, and the remainder of the cavity filled with gold. She readily consented to this pleasing prospect of securing the appearance of a large gold filling, little thinking or knowing of the result about to follow such an injudicious operation. The tin filling was placed and the gold filling over it, and the lady left the office highly pleased with the operation.

She soon afterwards felt a slight stiffness in the posterior part of her neck, which in a short time increased, and ultimately rendered the motion of her head difficult and painful, and there was experienced an uneasy sensation at the root of the tongue, which increased and caused great difficulty in mastication and deglutition; the eyes were apparently somewhat distorted, and the nostrils dilated, tonic spasm of the temporal and masseter muscles ensued, and the muscles in immediate connection with the jaws became painful; the stiffness of the jaws increased to such an extent as to produce complete occlusion.

There was, undoubtedly, a galvanic action excited between the two metals, the conducting facility of the metal irritating the nerve periphery in the pulp, and the irritation being referred to the appropriate centre, was thence reflected to the muscles of mastication.

Her system may, perhaps, have been in such a condition as to predispose to an attack of trismus upon the least exciting cause, and she may have been exposed to extreme cold or dampness, and thus the filling, which, in most individuals would, perhaps, result in nothing more than irritation, in her case produced trismus.

Fortunately, the filling was in a position where it could be removed, and this was promptly done upon her visiting the dentist several days subsequent to the insertion of the filling. After its removal, an application of the battery was resorted to, which afforded some considerable relief; the jaws could then be slightly separated. Tinct. lobelia was also administered, though in what doses I was unable to ascertain. In the course of a few days the lady pronounced herself fully recovered. After all irritation had subsided, a filling of some non-conducting substance was introduced, over which gold was placed.

Original Lectures.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

SURGICAL CLINIC OF PROFESSOR MEARS.

EXTRACTION OF TEETH IN CERTAIN AFFECTIONS OF THE JAWS.

The members of the class will call to mind that I have directed their attention to this subject when considering a number of cases which have been presented to our clinic this year. The case before us to-day presents so striking an example, in illustration of this subject, that I cannot but regard this opportunity favorable to its careful discussion.

The patient, from one of the interior counties of this State, furnishes the following history: "A. B.—æt. 29—native of this State; miller by trade. When four years of age he had some trouble with his teeth, which resulted in disease of the left side of the lower jaw. A good deal of suppuration occurred, and the physician removed a large piece of the bone. After the bone was taken away the parts healed, and he recovered his health, although he has had a swelling on the left side of his face ever since. Some time since he consulted a dentist, who told him he had a tumor of the upper jaw, and advised *the extraction of the teeth on that side* to relieve it. After the teeth were removed the swelling remained. He has had no pain in it, and it has not increased in size. Subsequently he was advised to have *all of the teeth of the upper and lower jaws extracted on the right side*, in order to have proper plates made for artificial teeth to supply the place of those extracted and lost by disease on the *left side*. To this he submitted, and artificial dentures were adopted. The swelling still persisting, he was advised to come to this city and have the tumor removed."

I will now ask you to examine the patient with me, and determine the character of this swelling. We will first examine the condition of the lower jaw on the left side, which the history tells us was the seat of disease when the patient was quite young. On inspection you will observe that there is a decided flatness or "falling in" (if we may use the expression) over the region of the jaw—the distinct outline of the jaw is destroyed. If the finger is passed over the border, it will be found to be irregular, presenting rough points and depressions. On passing the finger into the mouth and grasping the bone between the fingers and thumb, you will find but little left of the body and ramus of the jaw. Nothing but a thin shell remains, extending from the symphisis to the condyle of the jaw. The points of attachment of the internal pterygoid, masseter and buccinator muscles are destroyed.

On examination, the upper jaw will be found to be intact. Its surfaces present no deviation from the normal—the canine fossa is well marked, and there are no evidences of any disease involving either the substance of the bone or the maxillary sinus.

The teeth have all been removed, and he has, as a substitute for them, these dentures, which are well worthy of your careful examination. In position in the mouth, you will observe that they do not articulate, the upper projecting at least one-half inch beyond the lower. The former is made of rubber, the latter of metal, and is nearly heavy enough to answer, in an emergency, the purpose of a weapon of defence. These dentures, as you see, do not fulfill, in any respect, the purposes for which they were designed, and leave the patient, as you can readily infer, in a sad condition.

We have found by our examination, that the upper jaw is free from disease—the antrum is not implicated, as we have shown, by the normal condition of the *canine fossa*—an important diagnostic symptom. What, then, is the cause of the swelling on the side of the face? Manifestly, it is produced by two causes, which co-operate. First, the retraction of the masseter, assisted by the buccinator muscle, which have lost their points of insertion; and second, the "falling in" of the lower portion of the face, due to the absence of the ramus, angle and part of the body of the lower jaw. When the parts are dragged downward, the swelling, you observe, disappears; the extending force being removed, it returns. We are led, therefore, to the unavoidable conclusion, that no pathological condition is present, and that the extraction of the teeth of the upper jaw was performed through an error in diagnosis. The propriety of the removal of the remaining teeth, in order to secure the proper adaptation of artificial dentures, is a question to be answered by those skilled in mechanical dentistry. It certainly does not appear to accord with what we conceive to be conservatism in dental surgery, an element which, during the past few years, has entered largely into the methods of treatment, and which has characterized, in no small degree, the progress of the science and art of dentistry.

Happily this case is unique, and from it we pass to the consideration of a condition involving the teeth, in which extraction has been performed with more reason but with as little benefit as in the case just considered. I allude to the *trifacial neuralgia*, of which we have had presented to us recently a well-marked case. The patient, as you will remember, had suffered intensely from this affection, and had lost by extraction a number of teeth without the slightest amelioration of his sufferings. Tooth after tooth had been sacrificed in the hope that the extraction would relieve the agony endured by the patient. You will remember what was said to you when studying this case, and it is not necessary to discuss it at length at this time. An effort was made to impress upon you the error committed in extraction in these cases, by showing that the disease was not in the teeth but in the nerve which supplied them, and the pain was but a local expression of a general condition.

In some instances it is quite difficult for dentists to refuse to perform extraction, patients *insisting* that it should be performed, and taking upon themselves all responsibility, (if that can be done.) In these cases the patients should be referred to their medical attendant, and a complete course of medication should be adopted.

In the affections which we have considered we have found that the extraction of teeth, while inefficient as a remedial measure, produced no bad result, except such as would follow from the loss of perfect organs of mastication. In that which you are invited to consider now, *syphilitic affection of the jaw*, extraction is very frequently followed by the most disastrous results. Among the cases coming under our observation I shall ask you to recall two, which may be taken as typical, presenting, as they do in most marked manner, the symptoms which attend this condition. The first case was that of the man upon whom I operated for the removal of the greater portion of the left superior maxilla. His history was briefly this: he had contracted syphilis a number of years since, and, as he thought, had been cured by the use of mercury, although he did not employ the remedy for any great length of time. In the spring of the last year, when his health was not very good, he contracted cold, which located itself, as he expressed it, in a bad tooth in the left upper jaw, (one of the bicuspids.) He suffered intensely from the pain in the tooth and *in the jaw*. He went to a dentist, who extracted the tooth; the pain continued, and the face became swollen. He returned to the dentist, and another tooth was extracted with a view to relieve the pain and swelling of the jaw. The pain and swelling still continued, and shortly suppuration occurred. When the patient came to us he was suffering from necrosis, involving a large portion of the jaw.

The second case presented a similar history: the results, owing to the fact that the lower instead of the upper jaw was involved, were not so unfavorable. The patient, a woman, aged about twenty-eight years, had suffered from constitutional syphilis, and had employed a great variety of treatment, using large quantities of "nostrums" without benefit. Last winter, when *in poor health*, she contracted cold, which affected her lower jaw on the right side, where she had a bad tooth. The side of the face became swollen, and she suffered intensely from pain in the tooth and jaw. Regarding the attack as that of simple tooth-ache, she went to a dentist and had the carious tooth extracted. The extraction did not relieve the pain and swelling, which continued until suppuration was established; sinuses opened on the side of the neck, and she suffered for nearly four months from a very offensive discharge. An attempt was made to remove the necrosed bone through an external incision. When the patient presented herself at our clinic I removed the sequestrum, consisting of the angle and the greater portion of the ramus and body of the bone, through the mouth. The patient was placed upon anti-syphilitic remedies, and the parts healed rapidly, the bone being reproduced, as happens in the case of the lower jaw.

Now, let us review the histories in these cases, and study them together. Both of the patients were subjects of constitutional syphilis; neither had been subjected to persistent and long-continued constitutional treatment, although each had taken specific remedies. In each case cold was contracted when the patient was *in poor health*, and a carious tooth was the point of departure for the attack upon the jaw. Extraction was in each case followed by necrotic action, *periostitis* being present at the time.

There are several important points to be studied in connection with these cases. In the first place, they show the necessity of persistent treatment by means of constitutional remedies, mercury and iodide of potassium, used conjointly or separately as the case may require. When partial treatment is employed the specific poison is merely "scotched, not killed," and awaits an opportunity to spring forth and begin its devastating course. In these cases, the condition of "poor health" afforded the opportunity; the health being kept up to the highest standard, the constitution was enabled, as it were, to resist the influence of the poison; the vital powers being lowered, a part of least resistance presents itself and the poison lights up the flame of destruction. In this work the extraction of the teeth assists by the laceration of the parts, which necessarily takes place.

The *diagnosis* in these cases is usually not difficult, although at times it may be obscure. "Fish are sometimes found in the least suspected places," and you are liable to be deceived by the statements of patients. In illustration of this point I refer you to the case of the patient who was before us some three weeks since, suffering from the loss of the greater part of the soft palate and tonsils. The case was made very clear, not only by the condition of mouth and fauces, but by unmistakable signs in other parts of the body. The history of the case was also conclusive, notwithstanding the repeated denials on the part of the patient as to a knowledge of the cause. You are to remember, however, that the patients may be the subjects of inherited syphilis, and as such very honestly ignorant as to the cause of their trouble. In conducting your inquiries you should endeavor to elicit information as to both family and personal history so as to arrive at a correct diagnosis.

Having made the diagnosis, what shall be the *treatment?* Clearly the proper treatment is to treat the periostitis, and you should remember that you are not dealing with a simple inflammation, but with one grafted upon a constitutional taint. In conjunction with the ordinary means employed, anti-syphilitic remedies should be administered, and to these tonics should be added if the condition of the patient requires it. After treatment has been adopted for some time, and the patient's system is fully under the influence of the constitutional remedies, extraction may be performed and the patient escape harm. This was done in the case of the patient who came from St. Joseph's Hospital, where she had been under treatment for some time. In her case no bad results followed the extraction of two teeth, at a time when she was suffering severely from constitutional infection.

Let these cases teach you a valuable lesson in reference to the use of the forceps. If you heed the instructions they impart I am satisfied you will be more competent to treat the patients who place themselves in your care.

Leading Articles.

COMMENCEMENT AT THE PENNSYLVANIA COLLEGE.

The Seventeenth Annual Commencement at the Pennsylvania College of Dental Surgery, was an unusually brilliant one. Held for the first time at the Academy of Music, the parquette, parquette circle and balcony, were filled with the friends of the graduates and of the College, while the family circle even contained a large number.

Well selected music by the Germania Orchestra served to entertain the audience from the hour of opening the doors until 8 o'clock, when the Trustees, Faculty, Alumni, and friends of the College entered the stage from the rear, followed by the graduating class, who passed on to reserved seats in the parquette.

After prayer by the Rev. Wm. Rudder, D. D., the members of the graduating class were called upon the stage by the Dean, and in the absence of the Hon. Henry C. Carey, President of the Board of Trustees, the degree of Doctor of Dental Surgery was conferred by Dr. Washington L. Atlee, upon the following gentlemen:—

LIST OF GRADUATES, 1872-'73.

NAME.	STATE.	SUBJECT OF THESIS.
Weirich Z. Bentz	Pennsylvania	Continuous Gum.
Ira Brown	Ohio	Human Teeth and their Liability to Caries.
Lannes B. Bryan	West Virginia	Facial Neuralgia.
Jose M. Bustillo	Cuba	Inflammation.
Pedro Calvo	Cuba	Diseases of the Inferior Maxillary Bone, and operations practiced on the same.
Carlos D. Clemenceau	Cuba	Alveolar Abscess.
William B. Chambers	Ohio	The Origin and Use of Chloroform.
Charles B. Davies	Ohio	Circulation of the blood.
Leonidas Espinoza	Central America	Tartar or Salivary Calculus.
Peter K. Filbert	Pennsylvania	Filling Teeth.
Adam J. Flickinger	Missouri	The Teeth, their Origin and Development.
George W. Greene	Pennsylvania	Physiology of the Brain.
Benicio Guerrero	Central America	Syphilitic Affections of the Periosteum and Bones.
Edward P. Kremer	Pennsylvania	The Prevention and Arrest of Caries.
Hermann N. Loeb	Pennsylvania	Extraction of Teeth.
Evan B. Long	Pennsylvania	The Anatomy of the Teeth.
Henry C. Mansfield	Wisconsin	Dentistry.
Melvin A. Newman	New York	Comparative Anatomy of Teeth.
Joseph Pettit	Pennsylvania	Inflammation, its Causes, Effects and Treatment.
Henry R. Phillips	Illinois	Caries.
Joaquim Silva	Cuba	Affections of the Teeth.
David Smith	Georgia	Necrosis of the Maxillæ.
Thomas H. Smith	Ohio	Dentition.
Stoddard Southworth	New York	Bleaching Teeth.
Eugene S. Talbot	Illinois	Artificial Dentures.
John S. Thompson	South Carolina	Filling Teeth.
Cornelius W. Unger	Ohio	Caries of the Teeth.
James D. Warner	North Carolina	Practice of Dentistry.

After the conferring of the degrees followed a pleasing innovation in the shape of a brief but appropriate valedictory address to the faculty and graduating class, by one of their number, Dr. Joseph Pettit, of Pennsylvania.

The valedictory address on the part of the faculty was delivered by Prof. J. Ewing Mears, M. D., Professor of Anatomy and Surgery.

At the conclusion of Dr. Mears' address a benediction was pronounced by Dr. Rudder, and the large audience dispersed to the cheerful music of the galop by Carl, "*Je joller je besser.*"

The following is the list of matriculants for the past session, the class exceeding that of the previous year by seven members:—

LIST OF MATRICULANTS.

SEVENTEENTH ANNUAL SESSION, 1872-'73.

NAME.	STATE.	PRECEPTOR.
Emilio Alvarez	Central America	Dr. E. R. Pettit.
Casper E. Asay	Pennsylvania	Dr. A. M. Asay.
Weirich Z. Bentz	Pennsylvania	Dr. G. S. Searight.
John M. Bentz	Pennsylvania	Dr. G. S. Searight.
Charles F. Bonsall	Pennsylvania	Dr. Wm. H. Trueman.
Wilmer S. Bowles	New Hampshire	Dr. A. W. Howland.
Ira Brown	Ohio	Dr. Johns.
Lannes B. Bryan	West Virginia	Dr. J. W. Moore.
Thomas W. Buckingham	Pennsylvania	Dr. T. L. Buckingham.
Jose M. Bustillo	Cuba	Dr. J. Truman.
Pedro Calvo	Cuba	Dr. E. Rubio.
William B. Chambers	Ohio	Dr. A. Reed.
Sherman W. Chipman	Connecticut	Dr. A. B. Fuller.
Carlos N. Clemenceau	Cuba	Dr. G. T Barker.
Frank D. Clum	New York	Dr. G. T. Lewis.
George A. Coe	New York	Dr. H. A. Coe.
Joshua R. Daniels	Ohio	Dr. A. B. Hallowel.
Charles B. Davies	Ohio	Dr. J. Truman.
Percy G. Davidson	Virginia	Dr. G. G. Davidson.
Harry Y. Eastlack	Pennsylvania	Drs. Edwards and Fogg.
Joseph P. Eldridge	Pennsylvania	Dr. D. L. Pratt.
Leonidas Espinoza	Central America	
Domingo Ferrer	Cuba	Dr. J. Arce.
Willard S. Ferris	Connecticut	Dr. C. W. Strang.
Peter K. Filbert	Pennsylvania	Dr. H. B. Hamaker.
Adam J. Flickinger, D. D. S.	Missouri	Dr. A. Dienst.
Liberato J. Flores	Cuba	
Jacob F. Fryer	Pennsylvania	Dr. J. A. Andre.
Fred. E. Gleason	New York	Dr. W. H. Crary.
J. Alfredo Goule	Cuba	Dr. G. L. Rauck.
George W. Greene	Pennsylvania	Dr. E. J. Green.
Bernicio Guerrero	Central America	
T. Ellis Hancocks	Pennsylvania	Dr. T. L. Buckingham.
Ambrose W. Huckel	Pennsylvania	Dr. W. P. Henry.
Louise Jacobi	Prussia	Dr. J. Truman.
Willoughby L. Jacobs	Virginia	Dr. F. Wert.
Robert H. Jones	North Carolina	Dr. W. J. Hunter.
Edward P. Kremer	Pennsylvania	Dr. S. H. Guilford.
Hermann N. Loeb	Pennsylvania	Dr. Charles Silsbe.
Evan B. Long	Pennsylvania	Dr. J. M. Barrett.
Luther C. Longwell	Pennsylvania	Dr. M. R. Thompson.
Imanuel Lopes	Cuba	Dr. M. Laury.
James A. McAlister	Canada	Dr. J. C. Hatheway.
Henry C. Mansfield	Wisconsin	Dr. G. Mansfield.
Arthur D. Murphy	Russia	Dr. S. H. Linn.
James E. Murphy	England	Dr. D. B. Murphy.
Melvin A. Newman	New York	S. H. McCall, M. D.
Thomas A. Ortiz	Cuba	Dr. L. G. Howard.
Joseph Pettit	Pennsylvania	Dr. E. R. Pettit.
Henry R. Phillips	Illinois	Dr. J. O. Farnsworth.
George W. Philips	Florida	Dr. R. F. Philips.
Annie D. Ramborger	Pennsylvania	Dr. J. Truman.
George S. Searight	Pennsylvania	Dr. G. D. Z. Bretz.
Anthony B. Shultz	Pennsylvania	Dr. E. J. Greene.
Joaquim Silva	Cuba	Drs. Rubio and Beardslee.
David Smith	Georgia	Dr. R. G. Hamill.
Thomas H. Smith	Ohio	Dr. J. B. Beauman.
Alfred L. Smith	Georgia	Dr. D. Smith.
Stoddard Southworth	New York	Dr. S. S. Southworth.
Eugene Storr	Michigan	Dr. C. M. Wilkie.
Eugene S. Talbot	Illinois	Dr. T. W. Brophy.

NAME.	STATE.	PRECEPTOR.
Milton E. Teague,	North Carolina,	Dr. C. D. Huff.
David S. Thomas,	Ohio,	Dr. T. L. Hewston.
John S. Thompson,	South Carolina,	Dr. W. C. Wardlaw.
Edward M. Thompson,	Pennsylvania,	Dr. J. M. Stewart.
Cornelius W. Unger,	Ohio,	Dr. J. A. Court.
James N. Warner,		Dr. I. T. Andrews.
Henry H. Way,	Pennsylvania,	Dr. A. Way.
Valeska Wilcke,	Prussia,	Dr. J. Truman.
William Wildman,	Pennsylvania,	Dr. E. Wildman.

Appended is the report of the Demonstrators.

DEMONSTRATORS' REPORT, SESSION 1872-'73.

OPERATIVE DEPARTMENT.

Number of Patients visiting the Clinic,	2791	
Gold Fillings,		1557
Tin Fillings,		788
Amalgam Fillings,		16
Wood's Metal Fillings,		2
Hill's Stopping Fillings,		76
Oxy-Chloride of Zinc Fillings,		167
Removal of Superficial Caries,		43
Treatment of Pulp and Filling Pulp Cavities,		231
" Periodontitis,		56
" Alveolar Abscess,		72
" Inflammation of Gums,		39
" Partial Necrosis of Bone,		3
Correction of Irregularities,		6
Bleaching Teeth,		10
Removal of Salivary Calculi,		147
Pivot Teeth Inserted		5
Extraction of Teeth and Roots,		2591
Total		5749

Elihu R. Pettit, D. D. S., Demonstrator.
J. **Logan Saxton**, Assistant Demonstrator.

MECHANICAL DEPARTMENT.

102 Patients were supplied with the following Artificial Dentures and Appliances.

21 Full Upper and Lower Sets,	588
47 Full Upper Sets,	380
4 Full Lower Sets,	56
42 Partial Upper Sets,	230
4 Partial Lower Sets,	23
3 Obturators (Cleft Palate Cases),	12
3 Regulating Appliances.	
1 Inter-Dental Splint for Fracture Inferior Maxilla.	

Mounted as follows:

11 Full Upper and Lower, on Silver Base.
16 Full Upper, " "
25 Partial Upper, " "
4 Partial Lower, " "
2 Regulating Appliances, " "
10 Full Upper and Lower Sets, Hard Rubber Base.
11 Full Upper Sets, " " "
17 Partial Upper Sets, " " "
4 Full Lower Sets, " " "
3 Obturators, " " "
1 Regulating Appliance, " " "
1 Inter-Dental Splint, " " "

Number of Gum Teeth,	1191
Number of Plain Teeth,	98
Whole number of Teeth mounted for Patients,	1289

MOUNTED BY STUDENTS FOR PRACTICE, (cases not inserted,) AS FOLLOWS:

Number of Gum Teeth, on Metal Base,	1051	
Number of Plain Teeth, on Metal Base,	4	
Number of Plain Teeth, on Porcelain Base,	14	
Whole number of Teeth mounted for Practice,		1069

DEPOSITING CASES.

22 Full Upper Sets, on Metallic Base, No. of Teeth,	306	
1 Partial Set, " " "	5	
5 Full Upper Sets, Metal Base, Teeth attached by Rubber,	70	
1 Full Upper Set, set on Hard Rubber Base,	14	
Number of Gum Teeth,	395	
Number of Plain Teeth,	1	
Whole number of Teeth mounted on Depositing Cases,		396
Total number of Teeth mounted during Session,		2754

AMACEY B. ABELL, JR., D. D. S., Demonstrator.
A. H. HENDERSON, D. D. S., Assistant Demonstrator.

As to the operative department, comparison with last year's report shows that 716 more cases were treated during the present session, and in the mechanical department 1163 more teeth were mounted for patients and depositing cases. This is a most satisfactory exhibit, and, indeed, in it are seen the superior facilities of the school in its practical departments.

The surgical clinic for diseases of the mouth, by the Professor of Surgery, has proven a valuable addition to the practical department of the school, both for the advantage of the class and the alumni, who avail themselves of the opportunity offered by sending important cases from all parts of the country. The following includes some of the more important operations performed at this clinic:—

Alveolar Abscess,
Necrosis of the Superior Maxilla,
" " Inferior Maxilla,
Cleft of the Hard Palate,
Cleft of the Soft Palate,
Operation for Alveolar Neuralgia,
Paralysis of the Facial Nerve,
Fracture of the Inferior Maxilla,
Tumor of the Hard Palate,
Fibrous Tumor of Inferior Maxilla.

The faculty offer increased facilities for the ensuing year, and through these, together with the opportunities of the summer course, present unequaled advantages to those desiring a thorough dental education.

SURGICAL CLINIC.

A Surgical Clinic for the treatment of injuries and diseases of the jaws and oral cavity, will be held at the Pennsylvania College of Dental Surgery by Prof. Mears during the *entire year*, on Saturdays, at 11 A. M. Patients are requested to be present at 10½. Treatment gratuitous.

Proceedings of Societies.

THE ASSOCIATION OF THE ALUMNI OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Third Annual Meeting of this Association convened in the lecture-room of the Pennsylvania College of Dental Surgery, on Thursday morning, February 27th, 1873, at half-past ten o'clock.

After the reading of the minutes of the last Annual Meeting, the President, Dr. A. Lawrence, of Cambridge, Mass., delivered the following

ADDRESS.

Gentlemen of the Alumni Association of the Pennsylvania College of Dental Surgery:

We have assembled once more "to promote social intercourse, and by united effort to aid in every way the advancement of dental education."

As children gathering round the family circle, we come to salute our loved Alma Mater with respectful greetings, and by our presence afford all possible encouragement in furtherance of the great cause in which she has labored so long and so well.

On this pleasant occasion it becomes my most agreeable duty to briefly address you.

But how shall I best claim your attention? What theme, for the time, shall occupy our thoughts? Shall we contemplate the past, admire the present, and indulge in fond anticipations for the future?

Our time may not be misspent in devoting a few moments to these queries, so far as they relate to our profession.

The *past* is "the pit whence we are digged;" but he is a bad man who despises his origin without endeavoring to rise to a superiority of conception, mental excellence and conduct, that "the world may be the better for his having lived in it." The shades of oblivion may obscure the virtues and vices, the excellencies and short-comings of a past age, but the wise will improve by their commendable precepts and practice, and studiously avoid their mistakes and misdemeanors.

Every age, every generation, should be credited with living and doing collectively if not individually, according to the character of their surroundings and enlightenment, and we of to-day can do no more. To do less is to stand convicted, on the plea of guilty, of the serious charge of malfeasance toward God, the world at large, and to ourselves.

We, therefore—and because we love justice—honor the past for all its benefactions, and draw the mantle of charity over its frailties in the same kind spirit with which it is hoped the future will perform the like act in our behalf.

The highest conceptions of an age embrace their utmost limits of execution.

If Archimedes successfully taught the use of the mechanical powers, as they are termed, and could perform useful feats with the lever, the pulley, the whee and axle, the inclined plane, the wedge and the screw, he is not chargeable with ignorance because he did not apply the steam-engine in the accomplishment of his labors; for neither he nor any one of his time had conceived an idea, or at any rate a practical one, of any such thing. The steam-engine came with the necessity for it; and that necessity exercised and developed the mind of man so far as to enable him to meet the emergencies of the times, and mark an era in human improvement and progression.

When Franklin drew the electric spark from a passing cloud through a boy's kite-string, and found very nearly his match in energy, he did not establish telegraphy, but he laid the foundation, and the accomplishment followed in good time to bless the world and make it better.

Dr. Jenner, for accepting a hint given by a cow who had received the virus of small-pox from a milker having the disease, received as his reward not only the maledictions and revilings of the people, but also the ban of legislative enactment. He is now regarded as a benefactor to humanity.

Later, and within our own recollection, Horace Wells, of Hartford, Conn., demonstrated anæsthesia; yet only recently have his claims been sufficiently freed from the foul rubbish of pretension to be admitted. Now, after he has "passed beyond the swelling waters," it is proposed to erect a monument to his memory, as a fitting acknowledgment and memento of his great boon to the world.

If we search the ancient records for light in regard to any particular profession or calling in life, except in human butchery, we find them extremely meagre and unsatisfactory.

The Greek farmer and poet, Hesiod, who lived about seven hundred years before the commencement of the Christian era, in describing the catacombs of a still more ancient time, says that "there was found the gold with which their teeth were tied." Whether gold wires or bands were used in those days as a warp for supporting loose natural teeth, or as a means of attachment for artificial ones, we are not informed, and so far as we are concerned it would seem to be quite immaterial; yet we are privileged to indulge in lively fancies and think as we please.

Rudely outlined Egyptian hieroglyphics tell us that among that ancient people certain trades were pursued, and that some of the professions, as they are now called, were recognized and encouraged. The doctor was represented by the duck, whose peculiar warbling is to-day the expression and synonym of charlatanry, not only in medicine, but also in all other pursuits in life.

So far, however, these peculiar writings, or chiselings, have failed to afford any information relating to dentistry. Doubtless, the teeth of that ancient time were subject to substantially the same diseases as they now are, and it is equally probable that particular persons claimed a knowledge of such diseases, and the then best methods of treatment. But all this is merely conjectured, as also are the statements that gold-mounted artificial teeth, and natural ones beautifully filled with gold, have been found in the mummified mouths of those consigned to Egyptian burying places. Travelers who go into foreign countries, like Lord Lovell, "strange sights to see, see, see," are fully aware that he who on returning tells the most improbable story is the greatest hero, and is best entitled to the mantle of that immortal traveler, Baron Munchausen.

Leaving these obscurities, we pass several centuries towards the coming day, and find scattered along our path more tangible evidences of a growing tendency to an individuality for our specialty.

All there was of dentistry had by some means passed into, or was never out of, the hands of the barber, who, in addition to his tonsorial duties, was accustomed to cup and bleed, pull teeth and supply artificial ones, amputate limbs, reduce fractures, grind scissors and knives, dock colts, and do many other equally interesting things, requiring a high order of intelligence and much manipulative skill.

The artificial teeth were for a long time made of white vegetable gums or wax; but in the lapse of time, through progressive development, calves' teeth were brought into requisition, to be superseded by the crowning glory of the time, those carved out of sea-horse teeth. Out of the frictions of personal interest proceed personal as well as general improvement, and our friends of five or six hundred years ago were not exceptions. They were urged to the activities of their calling by their gastronomic impulses, in like manner with ourselves. They felt inclined to benefit everybody, and themselves the most. Their places of business were adorned with flaring striped poles; human teeth, more or less decayed, were so arranged on sign-boards as to form the letters of the proprietor's name; and bushels of such teeth were piled into the windows, while, contained in a tastefully made box placed in the doorway, ghastly and grinning rows of representative teeth, the material for which was kindly furnished by some oleaginous and mud-wallowing hippopotamus, welcomed the passer and piously chattered the praises of their maker and master.

The custom of displaying show-cases filled with dental trinkets, anatomical preparations, &c., although a relic of *barberism*, has not, I am pained to say, yet become obsolete. Only a few years since I had the satisfaction of being carried in imagination far into the past, by seeing in Quebec several show-boxes filled with the bone teeth, to which reference has just been made, near signs with ' Surgeon Dentist" displayed thereon, demonstrating that the owners were unfortunate in being born two or three hundred years too late.

Perhaps, however, the well-worn saying, "better late than never," may afford them sufficient consolation, especially if their aspirations fail to impel them to forsake the ruts of the good *old* way for the better and to-be-improved highway of the present.

It is quite satisfactory to believe that we are descended from no worse stock than the barber, and peculiarly refreshing that we have for our "big brother" the modern surgeon. Ours is an energetic family. The surgeon has studied hard, carved the earthly tabernacles of humanity into tangible solutions of inevitable questionings, and made for himself a name of which he may justly be proud: but let him charitably remember his extraction and push onward toward the inestimable wreath in reserve for those of earth who most deserve it.

Dentistry is not behind in the race, but with rapid and lengthened strides passes the landmarks of antiquity, leaping the barriers which would intercept his career, waving aloft the banner of science inscribed in characters of light, "Excelsior!"

The first exclusively dental publication of which I find any record, was by De Castrillo, in 1557, at Valladolid; and in 1570 republished at Madrid. This work of a few pages made its mark at the time, but would now be regarded as a light of other days. Eustachius sent forth "A Treatise on the Teeth," in 1574, and in 1578 "The Affections of the Teeth," by Monarius, appeared. Hemard illuminated 1582, by his "Researches upon the True Anatomy of the Teeth."

These, and one by Erastus in 1595, include all the dental text-books I am able to find accredited to the sixteenth century.

The seventeenth century was more prolific in books and pamphlets, and seems to have ushered in an era of physical suffering, as I find that thirty-one of the thirty-eight publications issued during that period were dissertations on tooth-ache and the remedies therefor. Among the earliest of the remedies for this cosmopolitan disease, were charms, incantations and cabalistic mummeries, which generally wrought a cure in six or eight weeks; then, a little later, came the more heroic treatment, the application of hot pitch to the exposed pulp. The somewhat classical expression, "the devil to pay and no pitch hot," may have been originated during these times. Hot needles, wires, &c., came in for their share of credit, and if they failed to cure, the burns inflicted in their application rendered rivalry out of the question, for however hard the tooth might ache, it was a source of positive comfort in comparison. Another custom among the courageous, was to place in the dental cavity a quantity of gunpowder, then ignite with a coal, or possibly, if the patient was his own dentist, he would apply a slow match and run to escape danger.

During the eighteenth century a marked improvement in the literature of our profession became manifest, and as a consequence, artistic taste and execution were equally improved.

In 1774, Duchateau conceived the idea of superceding the perishable and offensive bone-teeth by substituting those of porcelain. With a zeal worthy of better results, he labored indefatigably, and communicating his discovery to the Academy of Surgeons at Paris, in 1776, received a vote of thanks and was admitted to membership.

Twelve years afterward, M. de Chemant, a dentist whom Duchateau had consulted in regard to the application of these gray colored porcelain teeth, obtained a patent for the invention. Duchateau and others stoutly protested, but in vain Chemant had the law on his side, and he became the Bacon of his time. How true it is, that as the centuries roll on, similitudes in history constantly present themselves, as the patent for the *application* of vulcanite sufficiently demonstrates!

The mineral teeth of Chemant and others of his time, were pronounced perfect and never to be excelled, but higher conceptions have wrought most marvelous improvements to be still further improved. Why, gentlemen, if the best tooth makers of the present time had lived in those days —only an hundred years ago—and had produced what they now do, they would have been hung for witchcraft.

We come now to our own nineteenth century, remarkable for its rapid progress in everything pertaining to the essential welfare of humanity. Within the last seventy-three years, steam engines, electric telegraphs and power printing-presses have come into use, revolutionizing the world, arousing its faculties to a better conception of its duties and its destiny. The activities of to-day stand in pleasing contrast with the past. Like the beams of the morning sun upon the autumn azure of the distant mountain slopes, they cheer us with hope and make glad our hearts. We are living in an age of great events—of great possibilities and responsibilities, and who of us can fold the hands and say there are no duties for me to perform?

Let us tarry yet awhile in the immediate past, while we allude to our Dental schools, the first of which was the Baltimore College of Dental Surgery, established in 1839, through the zealous efforts of Harris and others, and which is still in existence. Of its soundness I need not speak; its usefulness is unquestioned; its faculty needs no praise from me; its graduates can speak for themselves and others too.

How my then young and ambitious heart throbbed with mingled hope and fear, when, in one of our beautiful Southern States, where I was then practicing, I first received the news of the establishment of a Dental College! If I might not be able to avail myself of its advantages, I did not forget that the door was open to others. But, thanks to the power in which we live, and move, and have our being, I have lived to have my fears banished and my hopes realized. Dental Colleges are a success and a blessing to humanity; but it is my opinion that this country is sufficiently favored in this respect for the present, as we have already some eight or ten institutions of the character in question established by legislative authority in different parts of our domain. Whether it is better to encourage the Dental Schools we have, rather than favor a damaging rivalry, seems to be a proper question for us to entertain. But Dental schools are not the only indices of our onward career. Brave men, and men of all degrees, find by the interrogative inspirations of the day, and impelled by various motives, now dare to think for themselves, to speak for themselves, and call in question pronounced theories and modes of practice, with results challenging our warmest admiration. Those in the valleys are now compelled, in self-defence, to take higher ground to escape the tide of professional and of public opinion, whose surging waters are sure to overwhelm those who are at ease in the Zion of intelligent progression, of scientific research, and thus fail to exhibit a commendable manual ability.

Titles, even, with no merit in the possessor, are no bar to the clairvoyance of a community, itself dwelling on the superior grades of intellectuality; still, occasionally a magnificently impudent and sparkling quack, either with or without a title, will succeed in both pence and praise where better men would most miserably fail.

But our profession is in advance of its former possibilities, its conceptions and its execution. Compare, if you please, the fillings of forty years ago, if one can be found, aye, of twenty or even ten years ago, with those by the best operators of to-day! Need I dwell upon a matter so evident and easy of judgment to any one, either in or out of the profession?

The best operators sometimes make mistakes; but success consists not in avoiding mistakes, but in not repeating them. When a man stands up squarely and solemnly declares that he makes no mistakes, has no failures, it is safe to infer that he is not only lying badly, but is an egotistical fool, who thinks his audience incapable of ordinary discernment.

The present is witness of a great change in the forms of dental appliances. New instruments are adopted and rejected, to be adopted and rejected almost sans limitation. Glistening steel is made to undergo numberless gyrations and contortions, and plugging points, serrated and non-serrated, are quite pointed in their claims to superiority. Gold foil is sometimes declared "rather soft," and per consequence, is roasted and baked into a disposition to adhere to its kind; but too much twisting and rough handling, as you all know, is apt to engender a rebellious disposition, and our "soft" friend becomes master of the situation, much to our disgust and mortification.

Hand mallets, mallets of wood, of steel, of rubber, and of lead, from a feather's weight to half a pound or more, and automatic jumping-jacks, marshal their forces *versus* hand-pressure; while burring engines and a thousand things of less merit crowd the board and demand justice! justice!!

All these things, and many more, belong to the *art* of dentistry of the present day, and come into use or disuse at the dictation of experience and scientific enlightenment, for, first of all, light is essential. No man can work in darkness; nor need we, since we have a literature of which we may justly be proud—whose illuminations are profitable, and whose guidance is reliable. Our institutions of learning are the nurseries of genius and beacon-lights to our professional advancement.

Among these luminaries, the Pennsylvania College of Dental Surgery has long occupied a prominent position, shedding its rays far and near—from one end of our country to the other—across oceans to ocean isles, and continents beyond. Among the oldest and best equipped for demonstrating the subjects presented to its classes, with unequaled facilities for clinical practice, and a zealous, well-informed, and respectable faculty, it deserves our respect, our sympathy and encouragement.

This language may seem somewhat patronizing, but I mean just what I have expressed. The simple fact is, this College needs better accommodations, a better building, a house of her own, into which no Shylock landlord may periodically intrude his sharp visage, and demand, "rent, more rent, and do your own repairs or leave."

Look at these apartments, gentlemen! Are they all they should be to serve the purposes of an institution so long established and performing so much labor as this? Can we conscientiously permit our Alma Mater, through our listnessness, indifference and parsimony, to tenant these "rooms up stairs" indefinitely?

In behalf of our profession, and the needs of a venerable institution, I appeal not only to your sense of justice and propriety, but also, most emphatically, to that exquisitely sensitive ganglion, the pocket. To effectually produce emesis in this vital organ is a consummation most desirable. The pocket is the seat of the conscience, the justifier of every act, the generator of brains, talents, station and respectability; yet, potent as it is in developing the world, it has no brains itself, but, subservient to the mandates of well-directed effort, it is powerful for good or evil.

Trusting that the time may soon come when we may look upon a creditable structure devoted to our educational requirements, and with becoming pride say *our* College, I leave the matter, in the confident belief that whenever—if ever—the subject shall assume tangible form, you will give it the consideration its importance demands.

Without prejudice to the immediately preceding remarks, I may be permitted to suggest that, in comparing the present exalted status of our profession, with its institutions of learning, its literature and high manipulative skill, with the fifty years ago, we have abundant reason and excuse for indulging in some degree of pride. Let us, then, congratulate ourselves on our standing among the learned professions, and strive by all honorable means to improve the talents intrusted to our care, that those who are soon to perform the duties now devolving on us may, at least, say we were honest and did the best we could. The time was when a dentist was simply tolerated, but the never-ceasing mutations of time, always elevating and improving as ultimate results, have perceptibly revolutionized our specialty, and established it as a distinct, useful, well-organized and everywhere recognized profession—the peer of any other.

Empiricism, it is true, always has and probably will continue to exist; but flashes of light here and there tell of the powers at work in the contest for excellence, and exhibit in striking contrast the awkward *self-mades* of the low country with the more enlightened, who build on the higher slopes, where the exhaustless lamp of science scintillates in countless rays from her innermost temple.

We all desire success; and success comes as the legitimate fruit of knowledge wisely applied.

We should not forget that wisdom is as essential as knowledge. A learned fool is indeed a sad spectacle, but a wise one would be an anomaly.

> "Knowledge and wisdom, far from being one,
> Have oftimes no connection. Knowledge dwells
> In heads replete with thoughts of other men;
> Wisdom in minds attentive to their own."

Success in one's profession or calling in life is, then, dependent on the talent, energy and application exhibited in its conduct.

Now, rejoicing in the light within and about us, and in view of our advantages, the high claims we assert, can we rest in the damaging belief that we know all that is ever to be known, and that the future will not exhibit a superiority of conception and execution?

Just so surely as the present is in advance of the past, the future will look back upon our time as simply having done the best it knew.

But we must keep to the race with ambitious care. If our brother and competitor, with steady nerves and intelligent guidance, takes a step in advance, accomplishing a seeming impossibility, we must bind our energies to the task of like or superior performance. He will kindly lend his aid to help us on in the paths which lead his way, and, thus fraternizing, we shall benefit each other while we cluster round the foundations of the temple at whose shrine we present our offerings.

Our fondest anticipations and best wishes for the future are best expressed in our solicitude for the present. So far as we improve in our sphere of life so far we benefit the world, and reflect our example upon the future, upon whose welfare we cannot fail to exert an influence.

> "—— The Future will but turn
> The old sands in the failing glass of time."

When nothing more is to be learned then will there be no one to learn. The destiny of man is ever onward and upward,—ever searching and craving his soul's greatest needs—light and the opportunity for doing good.

The time to come will soar above and beyond the visions of the present; and still and forever the future will exceed his swiftest flight, and millions yet unborn will stand amazed to think how little of so much they have attained.

After some routine business, the Secretary read the following essay:

TREATMENT OF EXPOSED PULPS.

BY WILLIAM C. WARDLAW, OF AUGUSTA, GEORGIA.

That it is desirable to preserve alive and restore to health so important a part of the living economy as a tooth pulp laid bare by the progress of caries, is a question it is scarcely necessary to discuss. It is not all of the functions of the pulp to elaborate the enamel and dentine, and its continued retention proves that it still has other duties to perform. In a "dead" tooth, or a tooth deprived of its nerve, the enamel is much more brittle and easily broken; there is less power to resist the encroaches of decay; the sentient power, contributing so much to the pleasure of eating, and enabling one to detect so readily gritty substances in his food, is lost, and the tooth, being very susceptible to irritation, any derangement of the system is apt to manifest itself at this weak point, causing great suffering.

For these and other reasons we assume that it is very desirable to preserve alive, in the full discharge of all their functions, every tooth pulp. Can it be done? Is a diseased pulp amenable to treatment? Why should it not be? There is *prima facie* evidence that it would be. It has a large supply of nerve-force and is very vascular, giving it the great reparative power characterizing the tongue, the penis and other portions of the body. It must be amenable to treatment, and if we are not able to institute the proper mode, it only goes to show that we are not thoroughly qualified for the practice of our profession. It is a legitimate demand upon us, and I call upon you men of conscience, who would discharge the full measure of your obligation to suffering humanity and the noble profession you have espoused, to bestir yourselves, to be up and doing, and prove yourselves equal to the occasion.

This, I think, has not been done yet. Advances have been made in the right direction, and we are awaking to the importance of the matter.

The latest and best mode of treatment—the oxychloride of zinc—is not satisfactory. It fails in the hands of many and does not seem to be uniformly successful with any. It is flattering, but delusive. In the case of an uninflamed pulp, freshly exposed, in a healthy system, the prognosis is favorable, but unfortunately these are the exceptional cases presenting themselves. We usually find them in a state of chronic inflammation, after having been subjected to irritation for some time, and here the os artificial fails. Why so? We think because of the irritating influence of the chloride of zinc acid, which cannot be counteracted by the previous soaking with creasote, carbolic acid or thymol. In fact, these seem to be but additional irritants. They are not used to reduce the inflammation, but for their disinfectant and stimulating properties. If, therefore, the inflammation be not first reduced, unless it is in a most tolerant system, the pulp will be devitalized. The continued and repeated use of creasote itself will kill a nerve.

I used to entertain the hope that os artificial would prove a useful non-conductor to interpose between a filling and a nearly exposed nerve, but repeated disappointments lead me to believe it is more fatal in this case than the other. The acid being absorbed through the thin lamina of dentine, proves fatal, just as arsenic would do.

Is there any other mode more promising of success? By closely studying the conditions to be met in the case, a better mode ought to be found. These conditions are, briefly, the removal of all irritants, the restoration to a normal condition, (resolution of the inflammation,) and the protection against future irritation.

We begin, therefore, by opening freely into the cavity, removing, as we proceed, all discoloration which would interfere with the reflection of the light. It is exceedingly important to have ready access to the cavity and to be able to see well into every part of it. Therefore open freely.

We proceed to carefully remove all decomposed dentine, using tepid water in copious quantities to wash out the debris. If the pulp be not palpably exposed the thin stratum of dentine overlying, it had better be preserved, as being a better protection than any artificial covering. The cavity, too, must be so shaped as to retain readily a filling

Having diagnosed now the condition of our pulp, we will combine local and systematic treatment, laying particular stress upon the latter. Our great trouble will be to get our patient to appreciate the importance of the matter and give strict attention to the regimen we prescribe.

With his malady located in such a small portion of the body as one tooth, and suffering no immediate pain from it, he cannot understand that other parts, and the system generally, are involved. We will have to impress him with the fact that, though apparently well, he is really sick—more seriously sick than he is aware of. We will talk about confining him to his room, or putting him to bed for a few days, and about the value of a live pulp—$50 or $100—and then he may give heed to our instructions to avoid all excitement, mental or bodily; to eschew stimulants, especially ardent spirits; to be prudent and moderate in his diet; to keep his bowels in a lax condition; and to keep the feet dry and warm—the last a most important consideration. Damp, cold feet, is the fruitful cause of a large proportion of the ills to which flesh is heir.

There is not one medical man even in a dozen who fully appreciates this fact; and many persons, suffering habitually with cold feet, will not believe it until convinced by being made to take off their shoes and put their feet to the fire at a time when they are not conscious of their being cold.

We should, therefore, require him to change his socks twice a day, toast his feet by the fire just as long as he has the time to do, and to take a hot pediluvium upon going to bed.

It is useless to attempt any local treatment if the general is to be disregarded—the latter being, if possible, the more important. A surgeon would not attempt the local treatment of a diseased eye without giving attention to the general system.

We will now go on with the local treatment of our irritated and inflamed, but not actually exposed pulp. We wish to restore it to a normal condition of health. Remove the cause and the effect will cease. If we can but protect it from irritation, time and nature will do the balance.

We will then make an application of creasote, cover with a pellet of dry cotton, and seal hermetically with hot wax, or otherwise, and watch closely for pain or leakage, giving it our immediate attention. If the protection against irritating influences has been perfect, all inflammation will be resolved in a few days; and in this condition we will leave it for the present.

In our next case the pulp is exposed and is chronically inflamed, and we pursue the same general course, seeking to remove the inflammation by occasional light applications of creasote for several days. Thorough cleansing with warm water and stopping closely the cavity is, of itself, often all that is necessary.

If, in the third case, the pulp is suppurating, we will touch it with nitrate of silver or other escharotic, and protect it in the same way.

The eschar affords the best protection to the nerve. The idea is to assist nature while she is doing her work of restoration by affording a perfect protection against all irritants, and in our examinations and local applications we must use the rubber dam or other appliances for excluding moisture. The fluids of the mouth should never be permitted to enter the cavity after the treatment is begun.

Again, if it be a case of recent exposure it is the most favorable for treatment.

We have, then, by the application of the general principles for the treatment of inflammation in any part, brought our four cases to the same condition—pulps, devoid of inflammation and normal, except as to the point of exposure. The remainder of the treatment consists in making this condition permanent, and depends largely upon the manipulative skill of the operator.

We want now to cover this point of exposure with something which will not irritate the nerve and will enable us to fill over it. Something of a plastic character naturally suggests itself. We have seen that os artificial is not reliable. Dissolved gutta percha might answer, if readily applied and a sufficiently thick film could be obtained. Plaster of Paris does not adhere with such tenacity as will allow of its being trimmed away, and is very porous I, therefore, prefer wax manipulated in this manner. Having my cavity perfectly dry, I take a piece of wax and warm as near the melting point as possible, press it into the cavity with my forefinger, and with a burnisher, just warm enough to melt it, flow it over the exposed nerve. The pain, if any, is only momentary, and the heat is not sufficient to cause inflammation. We have here a soft, non-irritating substance, readily and thoroughly adapted to the delicate nerve, now conducting and perfectly excluding all irritants, and have but to preserve this relationship and give time. When the wax is hard enough, at the present or the next sitting, we will carefully trim it out, leaving a thin lamina over the floor of the cavity, and upon this fill with os artificial. Believing the os artificial to be essentially porous, I trim it away enough to admit the insertion of a temporary filling of tin, amalgam or gutta percha. At the proper time a permanent gold filling may be inserted.

To anticipate or calm any commotion it may be well to institute prophylactic measures—counter-irritation, laxatives and antiphlogistics generally.

All of this requires great care and patience, but if the end will not justify the means it will be useless to make the attempt, for nothing less will satisfy the demands of the case.

My limited experience with this method gives me hope that it may prove effective, and I give it to the profession through this hastily and imperfectly prepared paper, only with the hope that some one else may be induced to try it and give us the benefit of his experience.

In opening the discussion upon this paper, Prof. TRUMAN said: It must be evident to every one that oxychloride of zinc has not proved a success as a capping for exposed pulps in every case, nor do I regard such a result possible. I have had no experience in capping with wax, as recommended in the essay just read. It may prove of value, but time alone can solve the problem. Almost everything has been used at times, and in turn has been found unreliable. Metal was successful in some cases, where great vitality existed. Under similar favorable conditions every mode has given good results. It is possible that time may develop some plan to preserve the pulp in full vitality, but I fear conditions will ever be a bar to universal success.

Prof. BARKER.—This subject of capping pulps has interested me very much, especially during the last ten months. All the papers we hear or read upon the subject are based upon individual cases. If isolated cases are alone depended upon, I can prove that the pulp, when in health, is entirely devoid of sensibility. The trouble is, we base our premises upon isolated cases. To me it seems perfectly fallacious that a portion of the pulp can be removed when sloughing, and that the remainder will be restored to health. What is the pulp? It is composed of a sheath, inclosing an artery, vein and nerve, and subject to all the diseases of these organs in other parts of the body. The pulp is frequently exposed in excavating a cavity, and in healthy persons may then be saved; but we can rely upon success only in such cases. Each year something new is suggested. Some persons are successful in the various methods recommended; others are unsuccessful in the use of the same means. We do not study the physiology and pathology of the pulp enough. We should treat it as when an artery is cut, which will rarely heal except when cut in the line with the vessel. I do not believe it possible that the flaps of the pulp can be brought together, after a piece has been cut out, so that union will take place. When the pulp is congested, we have constriction of the vessels at the apicial foramen, which, being composed of firm and unyielding walls, will not enlarge; hence the want of success in capping. I believe it is well to cap when circumstances are favorable, but not otherwise. Creasote protects the part from external irritation, but does not affect the vessels. The eschar must be thrown off. There must, also, be a change in the effusion of the pulp itself before a healthy condition can be restored.

Prof. Buckingham.—The subject presented is one of the most difficult we have to treat. The capping of a pulp, or its extermination, is a small operation in surgery, but a great one in the saving of a tooth. It requires as much skill to doctor a mouse as to doctor an elephant. So sometimes as much skill will be necessary to save a pulp as to save a limb. Individual cases alone are of no value. But an accumulation of individual cases leads to the adoption of a theory. It is not possible to save all pulps alive, but we may, perhaps, adopt a method of saving the pulps in the teeth of healthy persons. When pulps are nearly exposed, the partially decomposed dentine may recover its vitality; the salts of lime may be again deposited, and thus the pulp be preserved. When the pulp is in a state of suppuration what shall we do? We must consider the condition of the patient. Two persons may be wounded, the one being healthy the other not. Amputation may be performed in each case; the one recover the other die. The same is true of the pulp. When the conditions are different the results will not be the same. It is almost impossible to get a healthy condition, unless the pulp should be capped for some time. Something not irritating must be placed over it which it will tolerate. Os artificial is a good antiseptic, and in that measure preserves the pulp from spontaneous decomposition. It coagulates the albumen. If the pulp should be coated with creasote, carbolic acid or thymol, this coagulum may be formed sufficiently deep to leave healthy tissue below. If nothing but creasote is placed upon the pulp, it will, in time, run into decomposition. But if os artificial should be placed over it, it protects the coagulum for a long time, and in this manner protects the pulp. One of the great dangers of external wounds is in their exposure to the atmosphere. When exposed even for a short time, the germs of infusoria find a lodgment and produce suppuration. I do not say that it is necessary to be exposed to the air to produce suppuration, but exposure would certainly hasten it. In putrefaction, animal and vegetable organisms invariably appear. One of the most destructive agents to these organic bodies is creasote or carbolic acid. While in "grain and seeds it is shown that carbolic acid retards growth and development only while it is itself present. There is not an actual death of the germ, but its vitality is held in abeyance." It has also been shown that animal tissue, which has been soaked in a dilute solution of carbolic acid, may return to a normal condition. In the treatment of the pulp after it has been exposed, the course I would recommend is, to apply dilute carbolic acid, say one part in twenty-five of water, (water will not dissolve more than one twentieth of its bulk of the acid;)

if pure carbolic acid in its full strength be applied, the vitality of at least a part of the pulp would be destroyed, but the diluted acid would only destroy the germs of the infusoria and suspend the vitality of a part of the pulp, while the other part might be in its normal state; but if the pulp is left in this condition, the carbolic acid will be absorbed, and the part that has been diseased with such an irritant to the rest as to produce inflammation. To prevent this, I recommend that a capping of oxychloride of zinc be used, but this should not come in actual contact with the pulp. It should first be covered with a piece of parchment or some similar substance that had been wet with carbolic acid. The chloride of zinc is one of the best antiseptics, and it would prevent the part of the pulp that had been acted on by carbolic acid from running into decomposition when the acid has been removed.

The pulp is not changed into dentine, but only carries to the outside the fluids which form the dentine; first, by the formation of cells, which afterwards are changed into dentine. Dentine is not a deposit, but it grows as other tissues do. There is first a soft tissue, and then calcareous salts are deposited in the cells of this tissue.

Prof Barker.—Dr. Buckingham says creasote destroys vibriones. I do not think this is the case; but they may be detected with care. When creasote is applied to the pulp the tissue is cauterized or destroyed and becomes insoluble; hence the circulation is arrested. Nature takes the same course as when an irritant is applied to any other part. There is an effusion of plastic lymph, and a line of demarcation is formed. This cauterized tissue is only tolerated; it remains as an irritant. We then have congestion and a deposition of a soft material, and afterward of hard tissue, and recession of the pulp. The pulp cannot be preserved if suppurating. The cases reported in the journals as successful are selected cases, and not the result of capping indiscriminately. We must have the formative material upon *living* tissue, we cannot partially devitalize the pulp. What becomes of the carbolate of albumen that is formed by the application of carbolic acid to the pulp?

Prof. Buckingham.—According to Dr. Barker, it is possible for the pulp to become healthy after exposure. How far does this possibility extend? If saved in certain conditions, how far do these conditions extend? There is a lateral circulation by anastomosis, and one portion of the pulp may be healthy and the other diseased. Nature tolerates a certain amount of effusion, and when creasote is applied to the pulp a tissue is formed which is not entirely without vitality, and which may after a time become organized again; seeds have been preserved alive for hundreds of years; teeth have been transplanted and yet their vitality has been retained; some insects and plants may be dried, and kept for an indefinite time, and they will revive when moisture is again applied to them. How far may this be carried? There is a deposit of cells upon the outside of the living mass of the pulp, and these cells grow until the part is bridged over, and the space filled up by their growth extending from point to point of the tooth, as the pulp recedes.

Prof. Truman.—I agree with Dr. Barker, that no suppurating pulp can be saved.

Secondary dentine is produced by slight irritation in many cases. This is plainly evident in teeth worn down, and also in caries, producing consolidation of the tubes. Ordinarily there is not sufficient vitality in the teeth to produce secondary dentine; still less can it be produced in persons debilitated by syphilis, scrofula, &c. Indiscriminate capping of pulp, cannot, with safety, be resorted to; it will be impossible to save all, and of the number that retain the pulp alive, but few will exhibit an extra development of secondary tissue.

Dr. Bonwill.—I have been very successful in capping pulps with wool saturated with creasote, placing the oxychloride of zinc over this. If the pulp be freshly exposed I cap it without previous treatment; but if diseased, I bring it to a healthy condition first; success depends upon the care of the operator, rather than upon the method of treatment. My reasons for preferring wool to other substances are, that it is a non-conductor, animal in its nature, and allied to bone. It is not irritating, but rather tends to allay irritation.

Dr. E. T. Darby.—My experience in capping pulps with oxychloride of zinc has extended over twelve years, it being at first a personal one. I have now a live pulp which was capped with this material twelve years ago; I have been in the habit of using it in almost every case of recent exposure, and believe nine-tenths of all such cases may be preserved by it. I think it may also answer where there has been inflammation, if the pulp be properly treated before its application.

Dr. A. Wert presented a case in practice in which there was extreme sensitiveness to cold in a tooth, the pulp of which had been dead four years, it also having had an abscess upon it. Several causes for it were assigned by members of the association, but no satisfactory reason was elicited.

Adjourned to 3 o'clock.

AFTERNOON SESSION.

Upon re-assembling, at 3 o'clock, an invitation was extended to Dr. Charles Tomes, of London, England, to deliver an address before the Association to-morrow at 12 o'clock. The Secretary then read the history of a case of the successful re-implanting of a tooth, as follows:

RE-IMPLANTING TEETH—A CASE IN PRACTICE.

BY R. I. HAMPTON, D. D. S., OF ROME, GA.

I have for a long time had a desire to try the experiment of replanting teeth, and it was with no little delight that I seized the first opportunity that presented itself. As it is a somewhat new feature in our practice, and I have had some experience, both as operator and patient, it will probably be of some interest to others to know the result.

For several weeks during the past summer I was troubled with an exposed pulp on the second superior right bicuspid. As it was not convenient to have it treated in the ordinary way, I resolved to try extracting and replanting. So on the 31st of August, 1872, 4 o'clock P. M., I had the tooth removed by a medical friend, (Dr. C. H. Gorman.) I then removed the pulp and filled the fang with Hill's Stopping, and a cavity on each proximal surface with gold, occupying in all about one hour and a half's time. The tooth was now placed in a weak solution of carbolic acid over the spirit lamp and warmed up to about 98° F. Meantime the alveolar socket was rinsed with tepid water and treated with a weak solution of carbolic acid, when we returned the tooth to the socket, and by closing the teeth firmly it was forced home. (Owing to the inflammation present the latter part of the operation was exceedingly painful.)

On the morning of Sept. 1st there was considerable peridental inflammation and consequent elongation of the tooth. No acute pain, but much nervous prostration, with some tumefaction and soreness in soft parts. I used ice water freely in the mouth, and finely shaved ice applied (between cloths) to the cheek to control inflammatory action.

Sept. 2d. The tooth was comparatively comfortable, though still elongated, with increased tumefaction in the soft parts, extending over the cheek and into sub-maxillary gland. I painted the gum and cheek with iodine, and continued the use of ice.

Sept 3d. Symptoms unchanged until about noon, when the swelling commenced subsiding a little, which relieved the tension and rendered the face quite comfortable. Treatment unchanged.

Sept. 4th. All the parts quite comfortable. Inflammatory action arrested. Swelling abating rapidly. Late in the afternoon I discovered a slight issue of healthy pus from the neck of the tooth. Continued same treatment.

Sept. 5th. The tooth and entire face was quite comfortable. Peridental inflammation about all gone. No elongation of the tooth Swelling in the soft parts nearly all gone. Still a slight issue of pus from the neck of the tooth. Further treatment suspended.

Sept. 6th. There was no perceptible swelling in soft parts, except in the gum immediately over the tooth. No elongation of the tooth, no soreness, and the tooth becoming firmly fixed in the socket with very ltitle suppuration.

Sept. 7th. There was still swelling in the gum. No pain, no suppuration, and the tooth becoming more firmly implanted I renewed the application of iodine to the gum, and continued it until the 12th, the swelling diminishing all the time, when the parts all assumed their natural status.

About the 10th of December, while suffering from violent cold, the tooth become a little sore, similar, I imagine, to the soreness sometimes felt in teeth with imperfect fang fillings. With that exception it has been quite comfortable and doing its duty in the process of mastication.

I have for several years been a convert to the idea of replanting teeth, and believe now that the next step in that direction will be transplanting. The very fact that a tooth can be kept out of the socket so long, and then be tolerated by the economy, as demonstrated in the above case, leads me to believe that any other tooth might have done as well.

This paper elicited considerable discussion. Several instances of the operation having been performed by those present were mentioned, some few of which were entirely successful. The opinion seemed to be general that the great danger of the operation was the probability of its being followed by tetanus. The discussion occupied the balance of the session.

FRIDAY, FEB. 28—MORNING SESSION.

The meeting was called to order at 10 o'clock. The recommendation of the committee, who reported at the last annual meeting in favor of the appointment of committees upon the various branches connected with dentistry, said committees to report annually, which recommendations were at that time laid upon the table, were taken up and adopted.

The following essay was then read:

COMMON SENSE IN DENTISTRY.

BY S. H. GUILFORD, D. S. S., OF PHILADELPHIA, PA.

The phrase "Common Sense" is usually employed to denote that degree of intelligence, sagacity and prudence which is common to all men. This is its literal and original meaning, but in the course of time, by frequent use, it has come to include within its meaning many of the best and noblest impulses of the heart and brain; to comprise within itself many virtues and by them to be made up. Common sense and tact are almost synonymous terms, and have, not inaptly, been compared to the tail of a kite in their guiding, governing, restraining and balancing influence upon the human mind.

This virtue, if we may so term it, is a most desirable one, and one that should be possessed by every member of the human family, but that it is not is only too apparent to any one who goes through the world with his eyes open. We are constantly thrown in contact with persons who lack it; persons who, while they may have talent, are wanting in tact, and though possessed of true genius, lack common sense to guide and direct it.

So great an essential to success in life is it that we may well spend a little while in considering to what extent it is found among the members of our profession, and in endeavoring to persuade every dentist to cultivate it more assiduously in the future.

That there is a great absence of it among us we think no one will be prepared to deny, for in reading over our dental journals, or attending some of the conventional bodies, we cannot fail to be painfully impressed with the fact.

We would not wish to be too severe nor wantonly trample on anyone's feelings, but justice and truth compel us to say what we believe on this subject, and we do it in no fault-finding or complaining spirit, but only that we may all be benefited by seeing and meeting facts face to face.

Let us, then, see in what we are wanting; and first permit us to observe that we notice a lack of candor and honesty in the profession generally. Whether prompted by a desire to appear learned among their fellows, or whether they fear to await results, how often do we find persons giving an idea for a fact? A dentist conceives that such and such things are reasonable and feasible. He thinks that a certain result will follow a certain course of action, and, without waiting to make the trial, he rushes into a convention or magazine and states positively that a certain thing can be done, and recommends it to his fellows as perfect and never-failing. The natural result is that many, perhaps hundreds of those who hear and read his words, believe him, try it for themselves, fail, and lose confidence and perhaps patients.

This is no rare occurrence—it happens every day. All of us have at times been the innocent victims of these over-zealous and untimely instructors. There is no doubt that there have been hundreds of cases of wonderful operations and almost miraculous cures reported to the profession that never occurred at all, for they bear the stamp of improbability on their face, and were passed by by the intelligent and experienced dentist with only a pitying smile. No one cares to write down an absurdity, and so it is let pass to deceive the more inexperienced ones.

Another way in which this dishonesty manifests itself, although it doubtless is not considered such by the author, is in trying something that strikes them as new, and as soon as there seems to be the first promise of success about it they rush to the journals and proclaim it a great success, (as the exuberance of one's feelings at such times is apt to lead them to do,) when in the end they find it a failure, and not only they, but all those who have unfortunately been misled by the premature statement.

It is well to give a new and good thing to the profession. It is liberal and generous, and generally prompted by a good heart; but let us first wait, and by testing ascertain whether it is a good thing or not. If it be good, waiting will not injure it, and if it be worthless it will save many the trouble of finding it so at their own expense. No doubt many reported successes have in the end turned out to be miserable failures. We should take warning, and not be in too great a hurry to bring our discovery before the profession, nor yet to condemn that of others before we have given it a thorough and complete trial.

Several years ago, some time after the mallet had been introduced, tried and generally recommended to the profession, and indeed was used with the greatest success by nearly all the best operators, there appeared in one of the dental journals a communication from some one, who declared that the mallet was a failure and recommended that it be no longer used by the profession. Instead of tightening fillings he said it loosened them. He had tried it, and when hammering on one side of the filling it became loose on the opposite side, and *vice versa*. He no doubt was right and truthful in saying that it loosened his fillings, but his reasoning was at fault when he inferred that, therefore, it would loosen all other fillings. About the same time another article appeared in one of our leading journals advocating the "ventilation" of teeth where the pulp had been destroyed and root and crown filled. The writer claimed that after a tooth had been filled for a few years, the general health of the organ required that the filling should be taken out, the cavity well aired and ventilated and then refilled. He declared that he had patients who came to him regularly every little while to ask whether it was not time to have their teeth ventilated. I very much doubt whether this idea, so very farcical in its nature, ever deceived any one, even a beginner.

Again, a writer whose skill in preserving the natural teeth is certainly very great, declares that he, years ago, vowed never to pull another tooth, and that he never has since. The natural inference from such a statement is, that he is able to preserve all teeth, no matter what their condition, and is therefore calculated to deceive, and is neither honest nor just to beginners and the inexperienced, for if he never pulls a tooth, he probably knows where to send his patients to have it done.

Another advocates the painless extraction of teeth by the frequent and repeated use of arsenical paste about the necks of the teeth. The arsenic gradually loosens them and admits of their easy and painless removal. Was there ever a more horrible doctrine than this promulgated.

Still another recommends amputation of the dental pulp after the upper portion has become diseased. He opens up the pulp-chamber well, and then performs what is known in surgery as the "flap operation." With a delicate and sharp-pointed lancet he cuts a "V"-shaped piece out of the pulp, brings the lips together, lets them unite by first intention, and then fills permanently. If there were any use in such an operation, or any promise of success in its performance, how many of our patients, may we suppose, would submit to it?

Surely, these things are not as they ought to be. Call them by what name you will, plainly speaking, they are not honest; for they either recommend very absurd practices, or counsel a course of refined cruelty worthy of a Nero, for which there is no occasion and which human beings would hardly submit to. Such ideas as these, were they to come from mere tyros in the profession, would pass by almost unnoticed, but when they emanate from those high up in the profession, as all of those just mentioned have, except the first, it is the easiest thing in the world for the inexperienced to be led astray by them.

Another great fault of the profession, too prevalent in our day, is a tendency to prejudice and bigotry. Instead of following the bible injunction of "proving all things and holding fast to that which is good," too many of us are apt to prove only a few things until we find something that suits us and we consider good, and then to ride this hobby and make war upon any one who dares to advocate anything that seems to be opposed to it. We too often fail to recognize the fact that there is good in nearly all things, if properly used and kept in their place.

How well I remember, while at college, being taught by one of the professors, since retired, and having it drummed into me, that tin was the only metal proper to be used in filling teeth where gold was not used, and that the use of amalgam, under any circumstances, was an unpardonable sin in practice. Young, inexperienced and impressible, hearing this doctrine so frequently repeated, I naturally imbibed it and determined that, come what would, I would never use the vile stuff. I was terribly prejudiced against it, as were probably nearly all of the class, and I started out in my practice with the motto, "Gold, tin, or nothing."

After a year or two's practice on this plan, working as hard over a tin filling as a gold one, for half the pay, and living in a region of country where the moderate means of many required work less expensive than that of gold to be done, I found that I was working hard and getting very little for it. Finding, after a while, that *some* good and concientious dentists were using amalgam for second-class work, I determined to so far conquer my prejudice as to give it a trial. I did so, and not finding any such serious results following its use as I had been taught to look for, it has ever since had a place in my cabinet. Had

I not been so bitterly prejudiced against it in the beginning of my career, it would undoubtedly have been better for me.

It is all very well to carry around a tooth built up with tin-foil, to prove what can be done with it, but he who uses it in his practice, to the exclusion of amalgam, for cheap work, will probably find his patients no better off for it, and himself far worse off, pecuniarily. Those whose duty it is to instruct the young should be very careful not to instil in their minds a prejudice against anything that there is the least virtue in.

Another fault to be found with the great mass of practitioners of to-day is, the great prevalence of ignorance among them, True, with the dental colleges, the excellent journals and learned conventions, much is being done to remove this darkness and make it give place to light, and yet how much of it we do find. First principles, that should almost be grasped by the mind intuitively, or should have been taught among the first things by the preceptor, are, we are sorry to confess, to-day apparently not understood by many who have been in practice for a number of years. With all the means at our command there is really no good excuse for this ignorance, and where it exists, it is principally from the fact that the person does not try or care to be enlightened.

If this state of things cannot otherwise be remedied, we hope our State will soon find a legislature benevolent and just enough to pass a bill regulating the practice of dentistry. If men will not become wise of their own accord, when all the opportunities for doing so are freely offered, let us compel them by law to become so, or leave our ranks and thus benefit the public. When men would rather travel twenty miles to try and devise means for avoiding the rubber-tax, than go one to learn to fill a tooth well, a change is imperatively demanded. But, while blaming these men for their ignorance, may we not, all of us, be also blameable as in part contributing to it, or at least in not doing our full duty to overcome it.

Our journals are all, we think, managed with ability and give us the best in the way of information that they can secure, and yet, how many are there of the men of ability in our ranks who lend them their help? You can almost number them on your fingers. We have men in this city, and in all parts of the State and country, with bright minds, liberally educated, of decided literary ability, whose operations on the teeth are almost faultless, and whose wonderful success in practice attests their great ability, who seldom, if ever, write any articles for the journals. They have great talent, and originate many new and valuable ideas and improvements, which for some reason they do not give in a public way to the profession. These men probably do not care to take the time or trouble necessary to the preparation of an article for publication, but they should do it as a duty which they owe to their fellow-man. Our men of ability, if they want to do their share toward dispelling ignorance and elevating the standard of the profession, must recognise their full duty in this respect, and come up manfully and perform it. It will do them good to stop awhile in their race for wealth and fame, and lend a helping hand to their needy brethren. It will make the dental journals so much more valuable and necessary than they are now, that many who are not taking them will find that they cannot afford to be without them.

Our colleges are also not without blame in this respect. The professors certainly deserve great praise for their hard labor and the spirit of self-denial which prompts them to carry forward the good work of training young men for intelligent and scientific practice. They are doing more than aught else to dispel ignorance, but we think they could still further increase their usefulness, by trying a little harder to keep up with the advanced spirit of the age. The fundamental principles they teach are, undoubtedly, all right in the present light of science, but if they were a little quicker to apprehend new truths, new ideas, and new improvements, as some of our most successful practitioners are, they would bring their pupils more fully up to the times, and make their institutions all the more attractive and praiseworthy.

Another cause of this ignorance, probably, lies in some of our conventions, particularly the larger ones. The delegates to these conventions represent all grades of professional life; the learned, the inexperienced and the intermediate. As the conventions are national and universal in their character, care should be taken to have the exercises so arranged as to instruct each class represented. Those high up in the profession, who have mastered the manipulative processes, and have risen to the degrees of teachers, writers or authors, probably care very little about a discussion on mechanical dentistry, or the best form in which to prepare gold for filling teeth, but they should remember that there are those present who do, and who stand in need of just such information as they could impart. So, too, one who is fresh from college, and has just learned enough about filling teeth to make him eager for more information on the subject, will not be interested in a spirited discussion between our great Solons on the microscopic character of tooth-structure, and the presence or absence of interglobular spaces in the dentine. These learned discussions are useful and necessary, but they should not be allowed to occupy too much of the time of conventions to the exclusion of the more practical parts of dentistry. Each should have ample time for proper consideration, but one should not so much infringe upon the time of the other as to almost crowd it out and exclude it. In this way these conventions will be made more interesting to the average dentist, and possibly to all classes represented, and will draw to them many who now seldom attend them.

We are, all of us, in some sense teachers and instructors: whether holding a position in a college, a place on some journal, or an humble retiring practitioner, every man has his influence If we wish, then, to ennoble our profession and raise it to a position which we think it should occupy, we must be careful to use our influence, be it much or little, for the furtherance of this end. We, as a profession, must try more and more every year to rid ourselves of the vices and short-comings with which we are, unfortunately, incumbered, and to substitute in their places their opposite virtues.

We must try and find out new facts and develop new ideas, and give them freely to the profession, but not until we have tried them ourselves and feel assured of their value. We must give a fair hearing to the views of others, and if we cannot commend or adopt, be careful not prematurely to condemn them. Charity demands this of us.

If we are told on the one hand that the six year molars ought to be extracted, and on the other that it is barbarous and wrong to extract them, let us be guided by our common sense, and extract or retain them according to the circumstances of the case. We do not believe any fixed rule can be laid down for our guidance on such subjects. In many cases, doubtless, they ought to be extracted, while in some they had certainly better be allowed to remain.

If, again, we are informed that contour fillings are the only ones proper to be inserted by a first-class dentist, aad again, that they are worthless in point of durability, and that the only way to preserve the teeth from further decay on their approximal surfaces is to cut them freely away, so that they can never again come in contact, let common sense again have free play, and you will probably come to the decision that, while it is useless to cut away sound teeth, unsound ones will hardly be preserved, no matter how well filled, unless treated in this way.

If a new instrument, such as a drill or an electric plugger, is brought before the profession as a valuable and almost indispensable help to the good operator, let us not be too hasty to condemn the one as a noisy, painful and dangerous instrument, or the other as a wild, fiery, unmanageable piece of mechanism, liable to do more harm than good, for if we examine them carefully and try them faithfully, determined to bring out their good qualities, if they possess any, our common sense will probably, in the end, lead us to the adoption of both.

If a new plan is proposed for the capping of exposed pulps, or any suggestion made in regard to the therapeutical treatment of teeth, let us receive the suggestions in good faith, and with unbiased minds test it fairly in our practice, and then adopt or discard it as our common sense suggests to be best. In all these matters, and in a thousand others that occur daily, let us try always to receive charitably, to test thoroughly, and then honestly report our success or failure as the case may be.

If we do this, and in case of bigotry, dishonesty and uncharitableness, substitute charity, honesty and calm judgment, we will only be obeying the dictates of common sense, and while we will be reflecting honor upon our profession, we will at the same time be making ourselves happier and better.

The discussion of this essay turned principally upon the use and abuse of amalgam, and was participated in by Drs. Truman, Francis, Tomes, Bogue, Guilford, Lawrence, Buckingham and Abbott. It is regretted that this discussion, as well as those upon some of the other papers, are necessarily omitted.

The following essay was then read:

DENTISTRY AND ITS PROGRESS.

BY C. E. FRANCIS, D. D. S., OF NEW YORK.

It is not many years since dentistry was first classed among the intelligent professions, or even had any recognition whatever by scientific men. Formerly it was appended to some other vocation, and its practice limited to extracting teeth. Look back into the darker ages and picture to your view some Herculean son of Vulcan doffed in leather regalia, with brawny arms bared and huge fists, grasping with his brown callous hands a formidable looking turn-key, or rudely-constructed forceps of his own manufacture, and holding between his knees, with an iron-like grasp, the head of some unfortunate, agonized subject, while struggling heroically to dislodge a firmly-rooted rebellious molar; or, imagine an ignorant knight of the razor who considers himself a peg higher in respectability than his sledge-hammer neighbor, boasting of his expertness in the art of "tooth-pulling," while in his shop windows are exhibited, among jars of preserved lizards and snakes, the trophies of his dental warfare, arranged in festoons like strings of wampum or the dried scalp-locks which decorate the abode of the savage. This is a fair representation of dental art in its infancy, as our good old fathers will testify.

As time coursed on surgeons and physicians became engaged in this desolating dento-tragical crusade, robbing their unlucky patients of their grinders with an apparently unscrupulous relish, on the principle, I presume, as stated in the good old "Book of Books," "If thine eye offend thee, pluck it out and cast it from thee;" or, in odontological phraseology, "if thine tooth offend thee, tear it out." But as the world grows older its people get wiser and learn something by experience, even at its great expense. Mutilated jaws and distorted faces were results not pleasant to contemplate. The great difficulty of masticating food with but a few scattered grinders or with no grinders at all, was found to be a perplexing task and tolerated only from dire necessity, while dyspeptic stomachs, plainly indicated upon sour-visaged dials, became as common as they caused dispositions to become crabbed and petulant. What evils these, to transmit to posterity!

"Necessity" is said to be "the mother of invention." A want creates a desire for its gratification, and suggests efforts or devises means for its accomplishment. Toothless jaws could not execute the labor required or unreasonably expected from them, and this led to experimenting in the direction of furnishing edentulous mouths with artificial substitutes, that the food might be better masticated, the collapsed cheeks restored, and that cadaverous forms might assume a rotundity of appearance, permitting genial sunshine again to radiate from smiling countenances.

Here dentistry began to assume a new feature, and dental mechanism was introduced to offset the ravages of dental surgery. This brought new recruits into the field of operators, gathered from many trades and professions. In addition to the "doctors" there were silversmiths and school-teachers, machinists and second-rate clergymen, wagon-makers and broken-down merchants, unsuccessful tailors, tinkers in general, and tradeless adventurers! A pretty crew, indeed, to operate upon human teeth! Yet many progressive men were found in this promiscuous group, and some were men of genius. While the number of dentists thus began to multiply, efforts were made in another direction that would afford more benefit to suffering humanity.

Although artificial teeth were found to be better than no teeth at all, yet were far inferior for real use and comfort than good natural grinders, and, besides, the severe pain attending the operation of having firmly set teeth rudely torn from their bony embraces was greatly dreaded by most people, while some, indeed, would suffer the agonies of odontalgia for weeks or months rather than submit to this terrible ordeal. Thinking men and women began to wonder why some method could not be adopted for affording relief without sacrificing their offending teeth. There was suggested the idea of plugging up the cavities and checking further decay. This naturally led to experimenting, with a view of ascertaining the causes of toothache and the theory of caries. The physiological structure of the teeth became a study and their chemical analysis sought. The relation between the organs of mastication and other organs of the body were compared in both their physiological and pathological conditions. A great field was here opened for exploration, which seemed to widen at every advance.

The teeth constitute a part of the animal organism, and a very *important* part, as every sensible person must admit. To restore them to health and usefulness, when neglected, broken down and diseased, proved a task not easily accomplished. To insure success necessitated an ability to correctly diagnose and scientifically treat each individual case presented in its varied aspects, and to thoroughly understand the condition and physiological structure of the organ to be operated upon.

It required some degree of judgment to know how to properly prepare a cavity in a tooth and *when* in the right condition for receiving its filling, also in the choice of material best suited as a stopping in each particular case. It was also found that it required considerable manipulative skill to introduce substantial fillings, and that the fingers as well as the brain needed educating. Next to the care and restoration of teeth already diseased and broken, came the sensible idea of *preventing* decay, so the laws of hygiene were unraveled and theories propounded. A great reform was evidently necessary, for each new generation seemed to exhibit a poorer set of dental organs in the youth of the age than the preceding one, showing a serious condition of things and a sad deterioration of tooth structure, with signs of a general physical degeneration. People in this country were losing their teeth at a very early age, and it seemed as if, despite all effort to save them, they would dissolve away in many instances before their possessors had seen a score of years. Irregular arrangements of the teeth and contracted dental arches became common, and these being presented for correction, often taxed patience and ingenuity severely. There were also cases of diseased gums, absorption of the alveolar process, occasional fractures of the jaw, diseases of the antrum, &c., all requiring the attention of an intelligent dentist. Summing this all together, and understanding, as we do, the position which members of our profession now occupy in the community, and all that is required of them, must we not admit, that for successful results a practitioner of the dental art should be thoroughly qualified for the performance of these varied duties, especially when we take into consideration the fact that health, comfort, and, perhaps, even the lives of our patients depended much on the results of our operations?

What sort of education shall be demanded for our students? Let us see. To begin with, a generous *academical* education is important to members of every profession, and better fits them for any duty. Men of intelligence and erudition always take the most commanding positions among their fellows. No one will deny this. This, then, may be considered the first requirement for success; yet is too little considered. May the time speedily come when every private preceptor, as well as every college instructor, shall demand this requirement of all their students Then shall we surely see one grand advance in the right direction toward elevating the standard of our profession.

In regular office practice most of our time is spent in efforts to restore decayed and broken teeth to a condition that insures comfort and usefulness. Here our best energies are directed, and in this department should our students be thoroughly trained. Of course, they should become perfectly familiar with the structure of the organs upon which they are to operate, not only when in a condition of health, but when diseased, and possess the ability to treat them scientifically.

The dental student of the present must be a student indeed. His position, if properly filled, is one of almost incessant study and labor. In the study of general medicine he must nearly equal the general practitioner, and in all that pertains to his specialty he must excel. I believe the time is not very far distant when the dental surgeon will so far surpass the general practitioner in his knowledge of and ability to treat all diseases connected with the head and face as well as the oral cavity, that his aid will be frequently sought by the latter, as, indeed, it is occasionally even now. When dental students become educated to the required standard, then will their field of operations be more widely extended, and as their usefulness to mankind increases their services will command a correspondingly increased remuneration, and their vocation greater respect in all circles of society.

Let us, then, all encourage dental schools, and insist upon having our students thoroughly educated in all that pertains to our specialty, that they may be well fitted for the duties before them, and reflect credit and honor upon the profession in whose ranks they have enlisted.

The hour of twelve having arrived, Dr. CHARLES TOMES, of London, Eng., was introduced, and delivered an interesting and instructive address upon the development of the teeth. No synopsis of this address would do justice to it or to the lecturer, so it is not attempted. It is only necessary to say that Dr. Tomes expounded the new theory (if it may be called such,) in regard to the development of the teeth, which had been adopted within a few years, the improved methods of observation proving the previously received opinion to be erroneous. The thanks of the Association were extended to Dr. Tomes for his able address.

Prof. WILDMAN made a report of the operations performed in the college during the session just closed. This report will be found in full in another part of the present number of the "TIMES."

Adjourned to 3 o'clock.

AFTERNOON SESSION.

Upon reassembling at 3 o'clock, and after a further discussion of Dr. Guilford's paper, the following essay was read:

NEW METHODS IN DENTISTRY.

BY C. A. MARVIN, D. D. S., OF BROOKLYN, N. Y.

In all new departments of scientific effort or investigation, there is waged, from time to time, a conflict between what are called "old" and "new" methods. Often excited by a slight circumstance, it is fed by jealousy and prosecuted by prejudice, till it waxes very hot and assumes threatening proportions Still, it is a conflict which is often productive of benefit, either to the special scientists themselves, or to that part of the community whom the science is designed directly or indirectly to affect, or to both.

This occurs, it has been stated, in *new* departments of scientific effort, that is, in professions of recent birth, or any scientific pursuit which is in its infancy or minority. The limitation is not hastily made and has a satisfactory reason. In a new profession, differences of opinion exist as to what are and what are not *fundamental principles*. Standards are not yet settled. What are called "established rules of practice" are not agreed upon. So that when new ideas are advanced, there being no accepted standard by which to judge them, much discussion is likely to attend their introduction. It is only after the profession begins to have a history, after time and thought have established for it a basis of principles, that any degree of uniformity of opinions can be looked for or any centre fixed, toward which study, suggestion, experiment shall be directed.

There must be a beginning to all things. In the question before us the *beginning* is the *end*. By *end* I do not mean *termination*, but *object*. An object which shall be *the* object, the end and aim must be agreed upon first. This done, certain obvious principles, standing in close and inseparable relation to the accepted end, are at once and cheerfully acknowledged, and a point of progress is reached. But the conflict does not cease with this advance. It is waged still, as frequently and vigorously as before, but there is more method in it. Instead of a confused wrangle of discordant, often irrelevant ideas, having no common objective point, order and regularity mark discussions, the chosen *end* is ever made apparent, and kept conspicuously before the eyes of the contestants as the mark of their endeavor, the object of their pursuit.

This is the first point gained, and it is a great one. It is the anchor which holds the drifting vessel from being dashed about by adverse winds. It furnishes the first reliable rule for judging of spoken ideas. It supplies a test for principles. By the rigid and judicious application of this test a system of principles is gradually secured, and a second stage of healthful progress attained.

And now, by moving the stand-point of judgment back from the ultimate *end*, to any one of the principles of action by which that end is to be promoted, we are enabled to form a clear and just judgment as to the *methods* which are from time to time suggested. Do they embody a principle, a correct principle, one pertinent to the end to be accomplished? Here, again, the same conflict is renewed, but now it is narrowed down within smaller limits and pursued with a more rigid system, though with no less energy.

Here are the stages of progress. First, an end is chosen and fixed. Standing thereon, we observe certain general principles which infallibly tend toward this end, and we accept them. So much is gained. Now we move from the end and take our position on one of these accepted principles, and thence look out upon methods to judge of them. At every stage the conflict is waged, and nothing accepted till well contested.

But it was asserted, at the outset of this paper, that this conflict benefits the specialists who are engaged in it.

It is not now argued that this result follows, because of the general law that exercise promotes growth. A worthier argument can be adduced. The recollection that views when expressed will meet with severe criticism, makes a man careful what views he expresses and in what words he states them. Thoughtfulness in forming his ideas, a careful digestion of them, studious selection of language in which to clothe them, and above and beyond all, an intelligent reason for holding them, which he can state and support; these are the legitimate results of such conflicts as have been noticed. The inevitable consequence is a higher degree of intelligence, more active minds, more valuable ideas, greater brevity of statement, and a greater number of independent, self-reliant men.

But it was asserted that the community are also benefited.

This is obvious to the most casual thinker. The more practitioners are improved the more useful will they become, and the effect of their improvement must necessarily be felt by those to whom their services are rendered.

Having thus briefly set forth a general system of reasoning, it follows next to apply it to the special topic under consideration, viz: *New Methods in Dentistry.*

Dentistry, though not a new, is by no means an old profession. It is, therefore, exercised by fluctuations of opinion and disputations, frequent and severe, which are not as readily disposed of as though it could boast a longer history. Not to say that the older professions are not at times and frequently shaken by discussions. Were they not, stagnation would be the inevitable result. But for the reasons before enumerated, dentistry is agitated and rent more frequently, more variously, and for longer periods than they. This being so, thought should be directed toward the establishment of some sensible, reliable system of judgment, by which novel suggestions, methods, &c., can be tested. Rigid, practical rules, except of the most general character, will not do. Some of the details will be rejected, and the rule thus mutilated is no longer a perfect standard. We must ascend to a higher level, and create some test that will commend itself to the judgment of all. To suggest and examine some such system of testing new methods is the prime object of this paper.

Intelligent men are in the habit of thinking. When educated and trained to habits of industry, their thoughts take practical shape, and are specially directed toward their particular pursuit in life. In this manner they not only acquire a thorough understanding of that pursuit, of its excellencies and its elements, but they discover also its needs, and employ their thoughts in searching out means for its improvement. When these are made known, they impress different minds in a different manner. To some they are attractive, because of their novelty, for novelty has charms for many; to others, because of some mysterious virtue they are supposed to possess, for mystery has a powerful attraction. Others accept them because they come from men of acknowledged ability, while still others reject them altogether, either from caution, prejudice or obstinacy. Something needs to be done here to harmonize these conflicting sentiments. Some centre needs to be found toward which all can gravitate. That centre is *the end which all effort in the profession is designed to accomplish.*

What is that end? Clearly, the greatest good of those who commit themselves to the care of the profession.

If natural teeth are more valuable than artificial ones, then the end is to preserve the natural teeth.

If a healthy mouth is better than an unhealthy one, then to cure the diseases that occur therein is the end.

If useful artificial dentures are better than weak, loose, painful, natural teeth, then the end is to remove the one and supply the other. Under the guidance of an enlightened judgment, whatever is decided to be for the greatest good of the patient becomes the end—the one aim and object of effort. Having been chosen carefully, judiciously, for good reasons, it must remain the sole end. No diversion of opinion should be allowed—no uncertainty of judgment be for one moment entertained. An opinion carefully formed should be adhered to, else no good result can be expected. As a shifting target defeats the aim of the most skillful marksman, rarely receiving the well directed ball, so an object of pursuit which is constantly changing can never with certainty be attained.

The end being chosen, to secure it, principles of action must be understood and applied. Principles are the groundwork of all effective action. They are the roadbed over which the cars of effort run to the desired station. They must, therefore, be sound principles—principles that bear a positive relation to the end to be achieved. When understood, they must be relied on and faithfully put in operation. Principles are like friends, to be selected with caution, but once chosen they should be trusted.

Next come methods.

These are the agencies by which principles work. They are many and varied, but between them and the principles they carry into execution there should always be a tie of relationship intimate and perceptible.

Methods should be to principles what the branches of a tree are to its trunk—the medium through which the fruit is communicated to mankind.

Methods, it will thus be seen, can be judged without difficulty.

If the reasoning thus far pursued be correct and logical, then are we prepared with a simple test with which to prove our own methods and those which, from time to time, may be suggested; a test which, though it may vary in some details as differently constituted minds appropriate it, shall ever remain unchanged in essence and truthful in application.

Professional men are expected to possess an ability and stability of judgment not found in other and less learned pursuits. They are not expected to be "blown about by every wind of doctrine," to shift their ground on slight occasion, to pursue one track to-day and another quite diverse to-morrow. This expectation is not based *entirely* upon the particular avocation they pursue, though it is in some instances, but rather upon the fact that much study has been required to prepare them for a professional life. Study enlarges the mind not only, but also gives it the power of intelligent decision, of wise discrimination, of careful comparison. It enables a man to form opinions, to pronounce them and to adhere to them with positiveness. This effect of education is recognized very generally, and therefore educated men are presumed to have intelligent and forcible reasons for their conduct. In the examination of new methods, therefore, they should not disappoint this expectation by hasty decisions, largely influenced by prejudice, but should be just, reasonable and candid.

What is the object of the new method? is the first question to be asked.

This ascertained, settles one point. If the object be of no practical value, there is no occasion for further investigation, and the method may be dismissed for the study of a method whose end and aim are valueless is a waste of time. But if the object be a good one, the next inquiry should be, is there a method now in use to accomplish the same end? The answer will determine the nature of the investigation. In the one case that investigation will be positive, in the other comparative.

Let us consider them in order.

First, we will answer the question in the negative; there is no method now in use to accomplish the object set forth.

Here occurs the positive examination.

In pursuing it we naturally inquire if the proposed method has directness of aim? Does it lead directly toward the end to be accomplished? Is it founded on a correct principle—a principle acknowledged and proved to be sound and reliable? If so, there can be no reasonable objection to giving it a fair trial; and in that trial the method should receive just handling. It must first be well understood in all its details. In its application each detail should receive its full measure of care and attention, none being slighted, none left out.

Nor is a single trial sufficient; frequent repetitions, with studious observation of the effect of each detail, alone will produce familiarity with the method, and enable us to form a correct judgment of its value. If it stand the test and justify the claim made for it, we have gained something and in honesty should commend it. If it do not stand the test we are prepared to give a reason for rejecting it.

But in the second place, let us answer the question first put affirmatively. There are one or more methods in use to accomplish the same end. Now the examination becomes comparative, and our first query is, is the new method better than the old one? What are its claims to superiority?

Just here begins the conflict already spoken of, and just here is the precise place where calm, well-balanced judgment should assume sway.

Old things are not good merely because they are old, nor are they to be considered obsolete for the same reason. Antiquity proves some things but not everything. An old method, though very faulty, may have continued in use for many years because attention was not directed specially to its improvement. In such a case its antiquity only proves how averse men sometimes are to study and exertion, contenting themselves with what is imperfect, if they may but remain undisturbed in their indolent ease.

"What was good enough for the fathers is good enough for their children," is by no means to be accepted as an infallible proposition. The world moves; circumstances change; greater heights of science are scaled; greater depths sounded as the years roll on. Each succeeding age should surpass its predecessor in knowledge and achievement.

Therefore, with a becoming reverence for what is ancient, we need not, should not shut our eyes to its defects, but using the greater light, aided by the greater facilities of the present, we should seek to make advancement, so that the excellence of the ancient shall bear certainly no greater proportion to the excellence of what we achieve now than the light and facilities of the past bear to the light and facilities of to-day. In other words, we should excel the past in achievement as far as in facilities.

In comparing new with old methods, therefore, we should bring both into the same light and examine them well. If the old have faults, are uncertain in result, are founded on no perceived principle, and the new have the advantage in these respects, then our decision can soon be made.

If the old method effect its end surely but slowly, and the new with equal certainty but in less time, this is reason for superseding the old by the new.

If the old is complicated, the new simple, the latter is better. If both are equally successful and equally brief, but the new is more easily understood, more easily explained, the new is to be preferred. Mystery is not evidence of attainment.

But in new methods some novel advantage is usually claimed, and the judgment is apt to be deceived into accepting the novelty as a step in advance. Here is need of caution. The novel feature should be subjected to most searching scrutiny. Is it intrinsically an improvement? If so, look yet farther. In attaining this new advantage is some other and equally important one neglected, injured or jeopardized? If so, then is the novel feature a trap, a dangerous delusion, diverting the mind from that careful, unbiased consideration which should embrace *all* the important features of the subject before it. For instance, very great solidity of gold fillings is deemed a desideratum; hence the introduction of the mallet. Now, does the mallet, while condensing gold to a greater degree, injure or endanger its perfect adaptation to the walls of the cavity? If so, the greater solidity thus obtained is a step backward, for perfect adaptation is of more consequence than rocky solidity.

Again, saving of time is a desideratum, but does quick filling with heavy masses of gold endanger durability? If so, speed is loss, for durability is of more worth than an hour saved.

Reduction of pain is a desideratum, but does a painless operation in a given case necessitate imperfect preparation? If so, then the sparing of pain is the infliction of a wrong upon a patient, for a good operation is of more value to him than exemption from temporary suffering.

Proof of scientific attainment in a dentist is a desideratum, but does the use of methods which set forth this proof, add inconvenience to the patient and expense to the operation, and produce no better result? If so, then is it a fraud so to practice, for no dentist has a right to glorify himself at the expense of his patient's comfort or money.

Such examination will surely test the excellence of new methods, and when pursued candidly, fearlessly, conscientiously, we may safely trust the result, whatever it be.

Then will methods be adopted which alone are valuable, which will not be speedily thrown aside, and the profession be relieved from the charge of being mere experimenters, chasers after novelties.

Further discussion of this subject is unnecessary. Enough has been said to set forth the ideas of the essayist as to the reason why and the manner in which new methods in dentistry should be tested, and the further consideration of the matter is left for each to pursue for himself.

Prof. Truman.—The essay contains much of truth, Great changes take place in the minds of operators, leading them to alter their modes of doing things. It seems to me we are constantly see-sawing between the old and the new methods. Smooth points were in extensive use twenty-five years ago, then rough points, made by passing the file across the smooth ends; from this the growth to serrations was gradual, the long and sharp serrations being largely in favor. From this extreme we have gradually retrograded to short, almost microscopic serrations, and from these to smooth points, and some dissatisfied with these are on the way to serrations again over broken points.

If the method that we have adopted enables us to perform our work to the satisfaction of our patients and ourselves, we should, I think, hesitate before making any change. It is settled, beyond controversy, that gold can be packed by smooth points. To a certain extent we have cohesion of the lamina of foil, but do we obtain the desired amount of cohesion; or, in other words, have we the same solidity as we obtain by serrations? I think not. I have not been able to make a filling with smooth points that would not readily separate, with slight force, with the original lamina. The union is too slight to be depended upon. I have seen no reason in theory or practice to lead me to adopt either smooth points or broken points. They have their place, but, in my judgment, are far inferior to a properly serrated instrument.

Under the head of "new methods" may be classed burring engines. These are all useful, but I think over-estimated. While in many cases they expedite the operation, it is a question whether a majority of the excavations cannot be better performed by other means.

The mode of anchoring fillings by means of screws, while not new, is one of considerable value. Dr. Mack deserves credit for introducing these in a form readily applied and effectual. When the present mode of anchoring fillings, by deep retaining pits, was introduced several years ago, great opposition was manifested on the ground that it would endanger the vitality of the pulp by thermal action. This, to some extent was true, but the same objection holds to a greater extent against the screws.

Heavy foils were strongly advocated for a time; now, on inquiry, I learn that but a limited amount of heavy foils are sold. So, also, cohesive foils were used by most, at one period, now the tendency is to return to soft foil. Each has its place. The cases are exceptional where soft foil can be used to greater advantage than cohesive. We should not abandon either altogether, nor should we give up our individual judgment to the dictation of any supposed leader. The tendency is too much to follow, sheep-like, some one person, without analyzing sufficiently of the reasons upon which the change is based.

Dr. Morgan.—I investigate to some extent everything that is brought before the profession and adopt that which can be of use. I protest against the remark that the members of the profession do not do their own thinking. They have more boldness than those of any other profession, and do not follow certain leaders. They are less controlled than others. They seek out new methods, and test them, and give them only the value they deserve to have placed upon them. I regard the burring engines as invaluable, and while there are cases to which they are not applicable, there are others in which they will perform work that cannot be performed by the hands alone. Mack's screws I also consider invaluable in certain cases. We must be governed by circumstances, and use our judgment in every case.

Dr. Marvin.—Without any collusion on the part of the essayists, their papers exhibit the harmony of thought in the profession. The three subjects can be properly brought together. "*Progress in Dentistry*" is to be attained only when "*Common Sense*" is applied to "*New Methods.*" There is no pursuit in life in which we need to rely upon our judgment more than in the practice of dentistry. No formal rigid rule can be adopted. Cases are continually coming up in which judgment must be used Some say we should use nothing but gold in filling teeth; that if the tooth is worth anything, it is worth filling with gold. I differ extremely from this view. I give preference to gold, but there is virtue in tin and amalgam. So in regard to the extraction of the sixth year molars. Some say *never* extract them; others say *always* extract them. In diseases of the teeth some assert they can always be cured; while others, in certain diseases, extract the teeth without attempting to cure the diseases. In every case the dentist should rely upon the judgment which experience affords.

Dr. Abbott.—In regard to the use of the mallet, referred to in Dr. Marvin's essay, we find both extremes. Some desire a heavy mallet, others a light one. It is doubtless true that a gold filling, packed solidly, is apt to rock within the cavity unless packed carefully, and I agree with Dr. Marvin that it is better to obtain adaptation and stability than solidity. We find some dentists using Nos. 60, 120 and even 240 gold foil. I have experimented with foil from No. 2 to No. 40, and I take the ground that it is impossible to fill a tooth perfectly with No. 30, or any higher number of gold. Mack's screws are good in many instances, but there are objections to them. The claim is made that they will retain certain fillings better than in any other way, but there is danger of starting the thread by using the mallet, when they are depended upon entirely to hold the filling in. I think there is independence in the profession. One may advocate a certain course and a thousand will follow, but only to test the matter for themselves.

Dr. Abbott described his method of inserting Hill's stopping fillings and placing oxychloride of zinc over them in certain teeth, so as to leave the Hill's stopping exposed at the cervical wall when the oxychloride of zinc would be likely to be washed out.

Dr. Buckingham, having been called upon to do so, explained his mallet, which can be attached to any of the burring engines in use.

The thanks of the Association were extended to those gentlemen who had furnished essays.

SATURDAY, MARCH 1.

The meeting was called to order at 10½ o'clock. Dr. Bonwill described his method of retaining fillings by means of a foot-shaped gold or platinum wire, stating also his objections to Dr. Mack's screws, and the advantage his method had over Dr. Mack's. He also described his method of pivoting teeth, using a plate tooth for the purpose.

Dr. Mack controverted the position assumed by Dr. Bonwill, and described and affirmed the advantages his screws possessed. He also described his new method of pivoting teeth.

The election of officers resulted as follows:

President.—Dr. C. A. MARVIN, of Brooklyn, New York.
Vice President.—Dr. Spencer Roberts.
Recording Secretary.—Dr. Joseph Pettit.
Corresponding Secretary.—Dr. E. R. Pettit.
Treasurer.—Dr. W. R. Millard.
Executive Committee.—Drs. T. L. Buckingham, H. C. Register, G. T. Barker, James Truman and C. E. Edwards.

The President announced the appointment of the following committees, who will make their report at the next annual meeting. The first named gentleman of each committee is the chairman of that committee, and he will communicate with the others.

On Materia Medica and Therapeutics.—Dr. G. T. Barker, of Philadelphia; Dr. A. Lawrence, of Cambridge, Massachusetts; Dr. J. E. Line, of Rochester, New York.

On Chemistry.—Drs. T. L. Buckingham and William H. Trueman, of Philadelphia; Dr. William C. Wardlaw, of Augusta, Georgia.

On Dental Physiology.—Drs. James Truman, Robert Huey and S. H. Guilford, of Philadelphia.

On Operative Dentistry.—Dr. C. E. Francis, of New York; Dr. J. A. Salmon, of Boston, Massachusetts; Dr. E. T. Darby, of Philadelphia.

On Mechanical Dentistry.—Dr. E. G. Leach, of Boston, Massachusetts; Dr. E. Wildman, of Philadelphia; Dr. C. S. Stockton, of Newark, New Jersey.

On Dental Education and Literature.—Dr. D. S. Dickerman, of Boston, Massachusetts; Dr. A. L. Northrop, of New York; Dr. E. R. Pettit, of Philadelphia.

Other business matters were brought before the Association of no present general interest to the profession. The thanks of the Association were extended to the President for the able and judicious manner in which he had presided, and the Association adjourned.

The following letter was received too late to be read at the meeting, but it is with pleasure inserted with the report of the proceedings.

HONOLULU, SANDWICH ISLANDS, Feb. 15th, 1873.

Alumni of the Pennsylvania College of Dental Surgery.

DEAR BROTHERS:—Your Secretary, Dr. Pettit, knowing that distance and time would prevent me from being in person among the goodly number who will gather at the yearly "feast of reason and flow of soul" spread by our generous Alma Mater, kindly invited me to send you an essay. Could I, by anything I might write, add aught to the interest of the occasion, it would give me great pleasure. But please do not think of this as an essay, only a few random thoughts of a brother who has wandered into other lands, and perhaps has seen a few things new to most of you, and has had many experiences in common with you.

These fair islands, lifted up in this wide ocean, inhabited by a peculiar and interesting people, present to the enthusiastic student many deeply curious and instructive subjects of thought. But to none does the door open more widely than to him who attempts to solve the difficult problem—Why do teeth decay, and how shall the evil be stayed?

Mr. Darwin, when he was told by our naturalist, Rev. Mr. Gulich, of these valleys lying side by side at similar altitudes with identical vegetation, birds, &c., and yet each producing entirely different varieties of land shells, acknowledged that they presented features difficult to explain upon his theory of *Natural Selection*. So I have often thought, could some of our tooth philosophers have their theories tested by what may be seen here, they would be in a worse dilemma than the famous philosopher of Natural Selection notoriety.

Among the ancient customs of this people, which are peculiar, was their mode of interring the dead, depositing them in the numerous caverns or by the seashore, where the sands are constantly shifting, or preserving them as mummies, thus bringing the remains within easy reach of the observer. Thus we have no difficulty in reading the whole dental history of this people, whose ancestry runs back to an age of which there is no tradition. This is the more instructive, because we know all their articles of diet, their manner of preparing them for eating, and the periods in their history when each addition of fruit or vegetable was made to their limited variety. Before these islands were known to civilization as now, their chief article of food was *taro*, a root of the Arum family, which was baked and either eaten thus or pounded and mixed with water into a thick paste, which, when it has slightly fermented, is called *poi*. This, with fish, some varieties of sea moss, and a few berries and sweet fruits, were all they had. With civilization came oranges, limes, tamarinds, guavas, and other acid fruits and berries, with meats of various kinds, vegetables, &c., to increase their small variety, all of which are quite commonly used at the present day.

But civilization, with its many blessings, brought also to those simple heathen practices and diseases which still exert their baleful influence upon the nation. What dental changes, then, may we expect to find, as we note the transition of this people from the most primitive manner of living to the present?

In the most ancient burying places, especially by the sea shore, where the shifting sands have left hundreds of bleached skeletons exposed, perfect sets of teeth, both of adults and of children, are not rare. Where caries does exist, it attacked the gingival border the most frequently, next the grinding surface, leaving the approximate surfaces quite free. But since the introduction of acid fruits and the breaking down of the national health, a gradual change for the worse may be noticed, so that the young of to-day suffer more from toothache than the adult of former times could have done. And while I think that oranges, limes and tamarinds have had something to do in this work, yet their part is small compared to the general undermining of the system by that insidious enemy, syphilis.

I am confident that any one who has studied such developments as these, will readily infer that we have no reason to hope that the simplest dietetic regimen, followed through generations, will place a people beyond constant need of dental care; yet it will, by restoring a more natural and perfect nutrition, in a great measure save the young from the early decay and frequent loss of their permanent teeth, and bring the adult less frequently to dreaded dental operations.

We also infer that while the use of acid fruits, beyond any doubt, exert a damaging effect upon the teeth of those accustomed to them, their influence is slight compared with the evil results of a life not controlled by habits of virtue. You all appreciate that when, by any means, perfect nutrition is impaired, in addition to the deranged stomach, inflamed throat and gums, and foul breath, the dental organism will be among the first to suffer. One glance at the face of the young is sufficient to tell us what we may expect to find in the teeth, and if that shows a syphilitic inheritance, we know that there must be dental decay and its attendant ills.

We speak of syphilis because this is the most marked form of that class of diseases with which we come in contact. But there are many other forms of disease which are indicated upon the dental organism, whose treatment requires a different knowledge from that demanded in the most skillful filling of the teeth.

One of the great questions which interests us to-day is, as to how we shall best prepare ourselves to meet the increasing responsibility which the exigency of the times thrusts upon us, whether we will or not. The time has nearly, if not quite passed, when dentistry is to be regarded as an *art*, the knowledge of which can be gained from one man as well as from ten, and that without any previous culture of mind. We now feel, many of us very deeply, that it is a *science*, which requires for its elucidation the best and most cultivated powers of mind, and that none should take upon himself the responsibilities it involves without a thorough preparation, not merely in the few lines of thought that were formerly considered all sufficient, but in all those collaterals found in the study of medicine. Or, putting the thought in another form, we need and must have a sound judgment, which can only come from a clear, well-defined knowledge of the whole system. I presume I am not alone in the feeling of chagrin that comes over me, at often finding myself struggling with some of the weightier problems of life, without being able to bring to my help other resources than the knowledge acquired in two terms of lectures, whose time would not admit more than a tithe of what our professors and ourselves felt was of the greatest importance to a thorough understanding of the subject, and to form within us a condition of mind that would enable us to reach more just conclusions. I would have those who are planning to enter the profession save themselves these unpleasant thoughts, and their patients their frequently made mistakes, by first studying medicine, and then making dentistry a specialty of it. If dentistry is an art only, then this advice is of the most foolish character; but if it is what we claim it to be—a profession—then let us see to it that ignorance, whether literary or professional, finds not a place among us. The more fully we are prepared, the more widely and thoroughly will the field open in which we may do for humanity some of her most excellent work.

Yours, fraternally,

J. M. WHITNEY.

It is regretted that some who had promised essays were prevented from perparing them by circumstances beyond their control. As it was, much interest was manifested in the proceedings, which were well attended, and doubtless, everyone felt that it was pleasant and profitable thus to meet together, "to gather as children around the fireside" of our ALMA MATER.

ELIHU R. PETTIT, *Recording Secretary.*

Dental News and Miscellany.

FALSE TEETH.—According to the *British Medical Journal*, these caused the death of Cuvier, and were a source of discomfiture to Lord Brougham.

Cuvier, impatient at the interruptions of that perpetual interrupter, M. Glais-Bizoin, in the National Assembly, rose so impatiently to answer him, that he jerked his teeth out on the floor, and, stooping not less precipitately to pick them up, fell head-foremost, and struck his head against the floor so heavily as to give rise to the illness which proved fatal to him. M. Glais-Bizoin, then a very young man, promised himself to abstain from his fatal habit of incessantly interrupting; but he was incorrigible.

Lord Brougham, in the course of the proceedings of a great meeting of the Social Science Association, of which he was president, was stopped in the middle of a speech by his teeth falling out. After groping on the floor, and on presently resuming his speech, he made the best of the incident by observing, "Our teeth are sources of trouble from infancy to old age."—*Philadelphia Medical Times, April* 5, 1873.

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Vol. IX. JULY, 1871. No. 1.

THE
DENTAL TIMES,
A Quarterly Journal of Dental Science.

EDITED AND PUBLISHED BY

THE FACULTY

OF THE

Pennsylvania College of Dental Surgery.

E. WILDMAN, M. D., D. D. S.,
JAMES TYSON, M. D.,
Managing Editors.

PUBLICATION OFFICE: 1221 SPRUCE STREET,
PHILADELPHIA.

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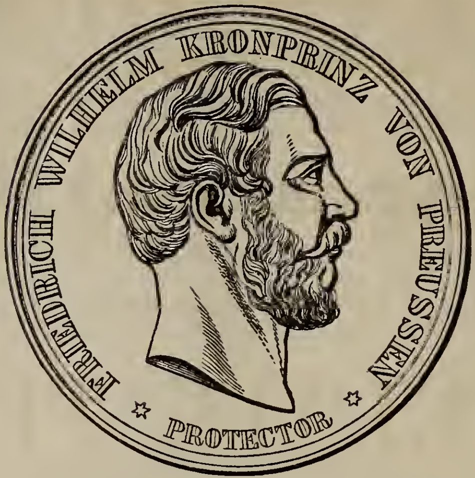
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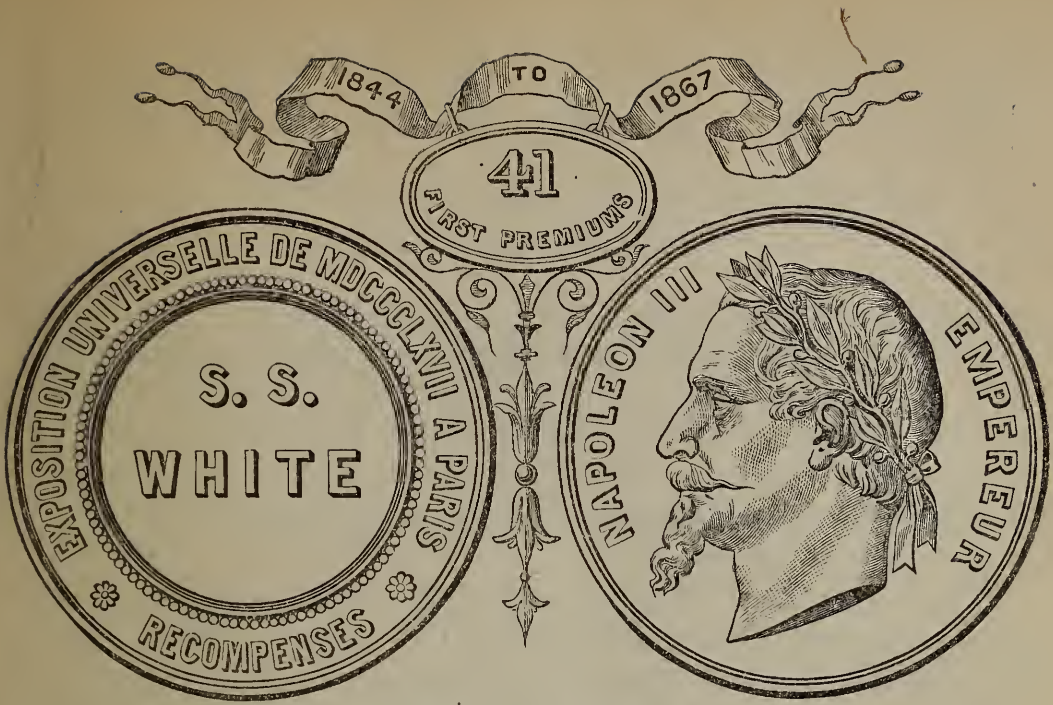

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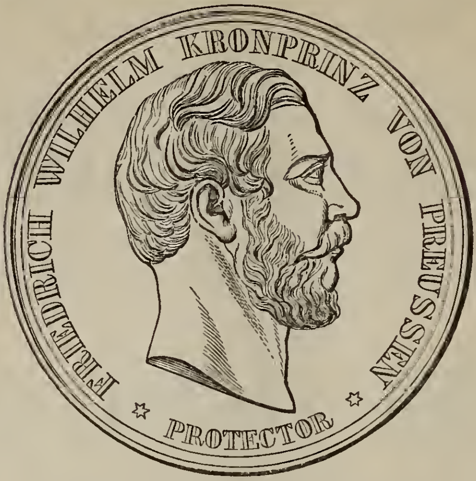
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PUBLICATION OFFICE: 1221 SPRUCE STREET,
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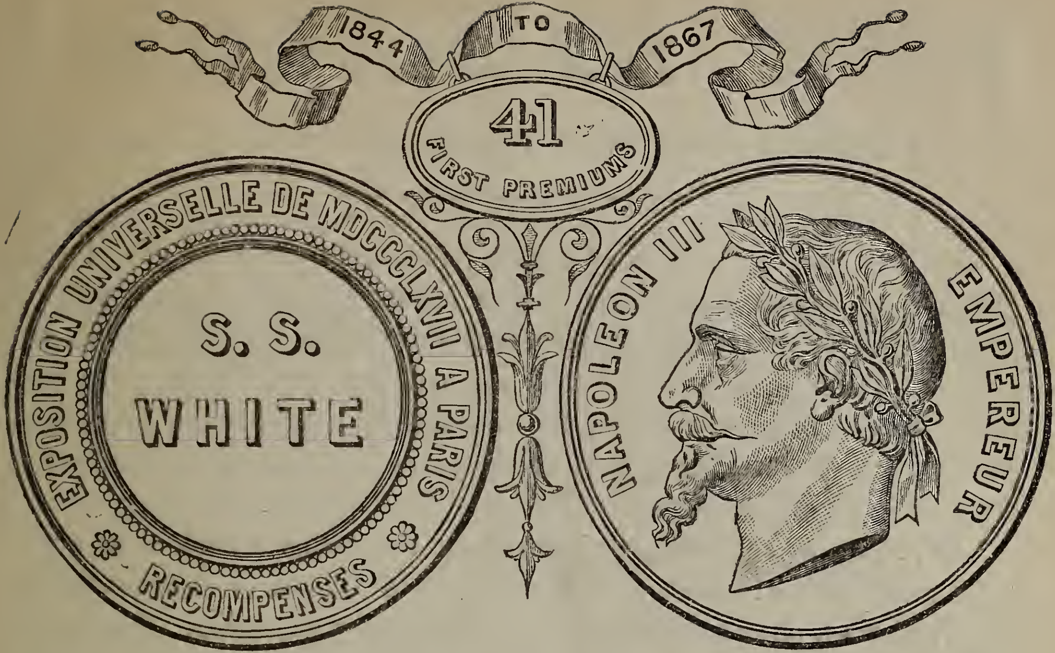

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A Quarterly Journal of Dental Science.

EDITED AND PUBLISHED BY

THE FACULTY

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Pennsylvania College of Dental Surgery.

E. WILDMAN, M. D., D. D. S.,
JAMES TYSON, M. D.,
} Managing Editors.

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PROFESSOR OF MECHANICAL DENTISTRY AND METALLURGY.

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PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS.

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E. WILDMAN, Dean,
1205 *Arch Street.*

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Seventeenth Annual Session, 1872-'73.

Preliminary Lectures and Instructions.—The Dispensary and Laboratory of the College will be opened on the 1st of September, when ample opportunities will be afforded the student, until the close of the session, for the prosecution of the practical part of the profession, under the guidance and supervision of Demonstrators of known integrity and capability. During October Preliminary Lectures will be delivered. In this month, as well as through the entire session, a clinical lecture will be given, and operations performed by one of the Professors every Saturday afternoon.

THE REGULAR SESSION

Will commence on the first Monday of November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical pecularities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND MICROSCOPIC ANATOMY.

The lectures from this chair will include human physiology, histology and physiological chemistry, with such portions of comparative physiology as are essential to a comprehensive understanding of the subject. The doctrines of life and organization will be appropriately considered. The course will be amply illustrated by appropriate diagrams, chemico-physiological experiments and vivisections, as well as by microscopical demonstrations.

ANATOMY AND SURGERY.

The instruction in this department will embrace a systematic course of Lectures on Descriptive and Surgical Anatomy, fully illustrated by dissections on the *cadaver*, preparations, models, drawings, &c.

The minute anatomy of the various organs and tissues of the body will be shown by the class microscope, and particular attention will be given to the demonstration of the anatomy of the head and face.

Clinical instruction in the diagnosis and treatment of the surgical diseases of the mouth will be given once a week by the incumbent of the chair. Students will thus have the opportunity of studying oral diseases, and witnessing the operations adopted in their treatment.

CLINICAL INSTRUCTION.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the demonstrators.

In the Operative Department.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with twenty-eight chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

In the Mechanical Department.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

Practical Anatomy.—The great facilities for the study of practical anatomy to be found in Philadelphia, in several well ordered and supplied dissecting rooms, present to the student advantages for its prosecution superior to those offered in any other city.

Hospital Clinics.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

FEES.

Matriculation, (paid but once,) - - - - - - - - -	$5 00
For the Course, (Demonstrator's ticket included,) - - - -	100 00
Diploma, - - - - - - - - - -	30 00

TEXT BOOKS AND WORKS OF REFERENCE.

Gray's, Leidy's, or Sharpey & Quain's Anatomy; Kirke's Physiology, (English edition); Dalton's or Flint's Physiology; Tyson's Cell Doctrine; United States Dispensatory; Stille's Therapeutics; Fownes' Elements of Chemistry; Brandt & Taylor's Chemistry; Flint's Practice of Medicine; Tanner's Practice; Tomes' Dental Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Wildman's Instructions in Vulcanite Work; Barker on Nitrous Oxide; Gross' or Erichsen's System of Surgery; Paget's Surgical Pathology, or other standard works on the same subjects.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupilage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usua ldental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

For further information, address

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All the Instruments and Tools required can be procured for from $15.00 to $20.00.

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The process of combining and purifying the metals is such as to guarantee comparative freedom from the tarnish of fillings, or discoloration of Teeth, so often observed from the use of ordinary Amalgam. Ten years' experience with it in the hands of some of the most skillful members of the profession has proven its excellence.

The increasing demand for a reliable Amalgam has prompted the introduction of this article, with the confidence that it will give entire satisfaction to those who use it rightly. To manufacture a superior Amalgam, always uniform in quality and texture, at a moderate cost, it is necessary to make it in large lots, and by the aid of machinery. It is also necessary that each lot be thoroughly tested by a competent Dentist before offering it for sale. The inventor has made such arrangements for its manufacture as to enable him to guarantee the reliability of every package.

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Our assortment of Block Teeth for Rubber Base is quite varied.

PRICES.

Blocks or Sections for Rubber Base,	20 cents.
Single Gum Teeth, " "	20 "
" " Plate Work,	20 "
Plain Teeth, for Plate Work,	10 "
" " for Rubber Work,	10 "
Pivot Teeth,	8 "

NOTICE.

Our Teeth for Rubber Work have DOUBLE-HEADED PINS. These are distinct and well formed. One of them is really inserted IN the tooth, the other is at the extremity of the pin, OUTSIDE. We thus secure a firm resistance in the body of the tooth, and ample space for the retention of the rubber around the pin outside. Our customers pronounce them Excelsior."

A Liberal Discount made to Wholesale Dealers.

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Plates of this metal worn for seven years, have not the least appearance of decomposition, and are still giving satisfaction to the wearers. As a cheap base for artificial teeth, this metal is applicable to a greater variety of cases than any other material in use. The *sharpest*, *lightest*, *thinnest*, strongest and most perfect plate can be made of this, than of any metal in market. It is perfectly tasteless and cleanly. Its adaptability is more accurate than that of any other alloy. It is equally applicable to *upper*, *under*, *full and partial* sets, and for temporary cases is far superior to all other bases. Plates for temporary cases can be cast so thin and smooth that ten minutes' work will prepare them for the mouth. Price, 1 lb. packages $8. ½ lb. package $4. ¼ lb. $2.

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M. DUSART, the eminent and conservative French Physiologist, who, after long continued and exhaustive experiments, has tested it thoroughly, is satisfied that it supplies the want recognized in the simple Phosphate, and believes that its definite action and powerful effect will soon cause it to rank with Bromide of Potassium and Hydrate of Chloral, as one of the most valuable of the new preparations which have lately been brought before the Medical Profession.

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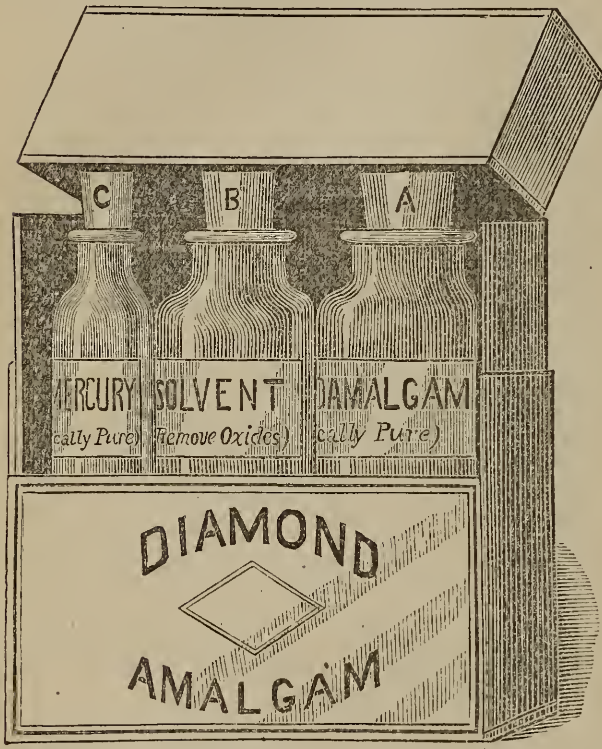
The advantages of this Amalgam are complete and perfect adaptation of the material to the walls of the cavity, with less shrinkage of the plug than with any Amalgam ever offered for sale, which we have demonstrated by actual experiment. Whatever statements are made to the contrary, it is nevertheless a fact that *no plastic metallic fillings are, or can be made, absolutely free from change of bulk during hardening.* This Amalgam when properly burnished and polished (and all Amalgam fillings should be thus treated) will retain, except under *very* unfavorable circumstances, a beautiful bright polish unaffected by use or oral secretions.



This Amalgam is no new compound, but has been subjected to the severests tests before offering it to the dental public. The discoloration of teeth by the Amalgams in general use is caused almost entirely by the shrinkage of the plug from the sides of the cavity and impure metals; but when this Amalgam is used as directed, the teeth will be found almost, if not absolutely, free from discoloration, and a good operator may insert fillings of this alloy in difficult positions which will bear critical comparison, as regards perfection and permanence, with the best gold fillings in the most simple cavities.

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Prepare the cavity carefully as for a gold plug, making either an undercut, groove, or retaining points, take as much Amalgam as is considered necessary into the palm of the hand, from the mercury bottle pour out a small quantity of that metal, and after uniting the two by rubbing them together, press out the superabundant mercury through the chamois skin by means of pliers, *throwing away* the mercury, which is unfit for use again. Then add to the mass a small quantity of the *Solvent*, and rub them carefully together, then with warm water wash the mass until the water runs off perfectly free from discoloration. The Solvent removes perfectly the oxides of the metals, which have been formed by contact with the atmosphere. Rub the mass until these are perfectly removed; when this is accomplished you have an Amalgam ready to introduce *chemically pure*. Proceed to introduce it into the cavity, as directed elsewhere.

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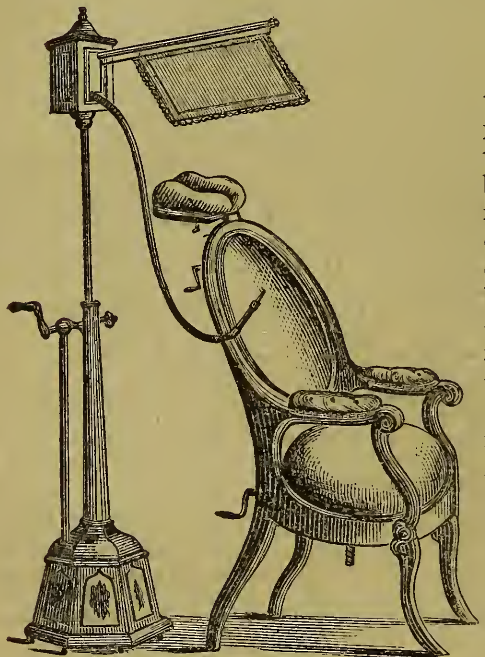

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The undersigned would respectfully call the attention of dentists and dealers who propose purchasing dental engines, to the fact that they will soon be able to furnish a beautiful automatic instrument, which will run from one to one and half hours, and which consists of a fan (for summer use,) a burring engine and a plugger *combined.* The fan can be used alone, or the fan and burring engine, or plugger as needed. The power is obtained from a coiled spring and gearing and is easily wound up.

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Vol. X. JANUARY, 1873. No. 3.

THE
DENTAL TIMES,

A Quarterly Journal of Dental Science.

EDITED AND PUBLISHED BY
THE FACULTY
OF THE
Pennsylvania College of Dental Surgery.

E. WILDMAN, M. D., D. D. S., } Managing Editors.
JAMES TYSON, M. D., }

PUBLICATION OFFICE: 1221 SPRUCE STREET,
PHILADELPHIA.
JOSIAH RITCHIE & CO., LEICESTER ST., LEICESTER SQUARE,
LONDON.

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THE DENTAL TIMES,

A QUARTERLY JOURNAL OF DENTAL SCIENCE,

PUBLISHED BY THE

FACULTY OF THE PENNSYLVANIA COLLEGE of DENTAL SURGERY.

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SPRING AND FALL SESSIONS.

The Spring Course of Lectures will commence on the first Monday in April, and continue until the last of June.

The Fall Course will commence on the second Monday in September, and continue until the last of October.

During the Spring and Fall Sessions there will be one Lecture a day, from 5 to 6 o'clock, P. M., and, with the exception of Saturday, the Dispensary and Laboratory will be open daily for six hours.

The Fee for the Tickets will be $50.

The attendance of the entire Spring and Fall Courses will be deemed equivalent to the term of pupilage under a private preceptor during the recess of the regular sessions.

THE REGULAR SESSION

Will commence on the first Monday of November, and continue until the first of March ensuing. The course is so arranged that about eighteen lectures will be delivered each week on the various branches taught in the College. A synopsis of which is given below:

CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

MECHANICAL DENTISTRY AND METALLURGY.

The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical pecularities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND MICROSCOPIC ANATOMY.

The lectures from this chair will include human physiology, histology and physiological chemistry, with such portions of comparative physiology as are essential to a comprehensive understanding of the subject. The doctrines of life and organization will be appropriately considered. The course will be amply illustrated by appropriate diagrams, chemico-physiological experiments and vivisections, as well as by microscopical demonstrations.

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The instruction in this department will embrace a systematic course of Lectures on Descriptive and Surgical Anatomy, fully illustrated by dissections on the *cadaver*, preparations, models, drawings, &c.

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Clinical instruction in the diagnosis and treatment of the surgical diseases of the mouth will be given once a week by the incumbent of the chair. Students will thus have the opportunity of studying oral diseases, and witnessing the operations adopted in their treatment.

CLINICAL INSTRUCTION.

In addition to the above, with the exception of Saturday, four hours are daily spent by the student in actual practice under the supervision of the demonstrators.

In the Operative Department.—To afford every facility to the student to acquire a thorough practical knowledge of this branch, the operating rooms are furnished with forty chairs, so arranged as to command the best light, and all the appliances for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate. Every student is required to provide his own instruments, except those for extracting. He is expected to keep them in perfect order, and will be provided with a place in which they can be locked when not in use.

In the Mechanical Department.—In the Laboratory are all the conveniences for the preparation of the metals, manufacture of teeth, single and block, mounting, &c. Every process known in the profession, which has any value to the mechanical dentist, is fully taught, and receipts of valuable compounds are freely imparted; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression of the mouth to the entire construction of the denture, and its proper adjustment in the mouth of the patient. Every student is required to furnish his own bench tools, and will be provided with a drawer which he can lock.

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Hospital Clinics.—In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of dentistry, the celebrated hospitals and clinics of the city constantly enable the students to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Pennsylvania and Philadelphia Hospitals, two of the largest eleemosynary establishments in the world, are open to medical and dental students, free of charge.

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Gray's, Leidy's, or Sharpey & Quain's Anatomy; Kirke's Physiology, (English edition); Dalton's or Flint's Physiology; Tyson's Cell Doctrine; United States Dispensatory; Stille's Therapeutics; Fownes' Elements of Chemistry; Brandt & Taylor's Chemistry; Flint's Practice of Medicine; Tanner's Practice; Tomes' Dental Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Wildman's Instructions in Vulcanite Work; Barker on Nitrous Oxide; Gross' or Erichsen's System of Surgery; Paget's Surgical Pathology, or other standard works on the same subjects.

QUALIFICATIONS FOR GRADUATION.

The candidate must be 21 years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures (at the regular sessions) in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College. Also satisfactory evidence of having been in practice five years, inclusive of term of pupilage, will be considered equivalent to the first course of lectures.

The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usua ldental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended

to the Board of Trustees: and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

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" " for Rubber Work,	10 "
Pivot Teeth,	8 "

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EXTRACTS FROM LETTERS RECEIVED.

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Dr. Weston.—My opinion is decidedly in favor of your New Metal as a substitute for non-expensive dentures.

Geo. T. Barker, D. D. S.
Pref. Pathology and Therapeutics Penna. College Dental Surgery.

Belleville, Canada, Sept. 25*th*, 1872.

Dr. Weston.—I wore a large plate of your New Metal for some time and found it superior to gold; there is no galvanic action, it is easily worked, fits better than gold and is stronger than rubber. We use it for clasps on our rubber plates with great satisfaction.

I am, yours truly,
G. V. N. Relyea, M D.

New York, Dec. 6*th*. 1871.

Dr. Weston.—My wife has worn a full plate of your New Metal since 1863, now eight years, to her perfect satisfaction.

Yours truly,
C. T. Bliss, M. D.

Canton, Pa., Sept 9*th*, 1872.

Dr. Weston.—I have used your New Metal since its first introduction, not only as a substitute for rubber, but in all cases where ordinary priced dentures are required. I find it gives entire satisfaction to my patients. Its strength and purity make it preferable to rubber in every respect.

Fraternally yours,
M. D. L. Dobson.

Oneida, N. Y., Sept. 9*th*, 1872.

Dr. Weston.—A year ago I commenced using metal for cast under plates. After trying all the alloys in the market for that purpose, I have decided that your New Metal is much the best of them all. My patients like it much better than gold, silver or rubber. It does not tarnish in the same mouth that tarnishes fine gold. I consider it al that can be desired for a base for under artificial teeth.

Yours truly,
F. Norton,
Oneida Community.

Towanda. Pa, Sept. 5*th*, 1872.

Dr. Weston.—I am wearing a full upper plate of "Weston's New Metal," it is as tasteless and cleanly as fine gold. I prefer it in my own mouth to any other material as a substitute for rubber. I would recommend it before celluloid or any other cheap base in all cases.

C. M. Stanly, Dentist.

Danbridge, Tenn., Nov. 4*th*, 1872.

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Yours truly,
G. A. Miller.

Towanda, Pa., Aug 31*st*, 1872.

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In ¼ lb. "	2 00		

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The advantages of this Amalgam are complete and perfect adaptation of the material to the walls of the cavity, with less shrinkage of the plug than with any Amalgam ever offered for sale, which we have demonstrated by actual experiment. This Amalgam when properly burnished and polished (and all Amalgam fillings should be thus treated) will retain, except under *very* unfavorable circumstances, a beautiful bright polish unaffected by use or oral secretions.

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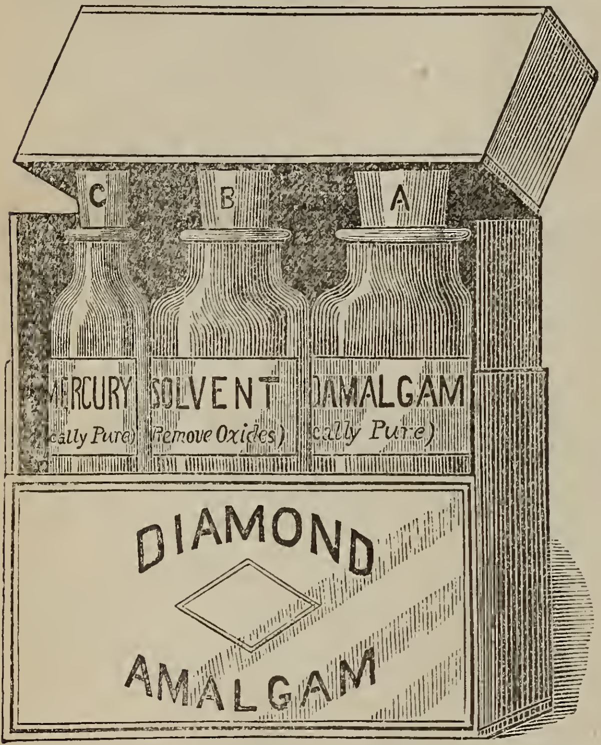

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FROM AMALGAM,

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Carefully prepare every cavity as if for a gold filling.

2d.

Carefully prepare the Amalgam, and pack in small pieces, so that there is perfect contact with every portion of the walls of the cavity.

3d.

Keep the cavity and filling *dry* during the whole operation of filling.

4th.

Use only Amalgams compounded of pure metals. If the above cautions are observed, Amalgam fillings will be found to answer a necessity, as there are circumstances where only plastic fillings can be used advantageously.

This Amalgam is put up in the following careful manner:

A. A bottle containing the Diamond Amalgam.
B. A bottle containing the Solvent.
C. A bottle containing pure Distilled Mercury.

All enclosed in a neat paper box, in which is also placed a piece of chamois, the whole forming a compact and exceedingly desirable package.

DIRECTIONS.

Prepare the cavity carefully as for a gold plug, making either an undercut, groove, or retaining points, take as much Amalgam as is considered necessary into the palm of the hand, from the mercury bottle pour out a small quantity of that metal, and after uniting the two by rubbing them together, press out the superabundant mercury through the chamois skin by means of pliers, *throwing away* the mercury, which is unfit for use again. Then add to the mass a small quantity of the *Solvent*, and rub them carefully together, then with warm water wash the mass until the water runs off perfectly free from discoloration. The Solvent removes perfectly the oxides of the metals, which have been formed by contact with the atmosphere. Rub the mass until these are perfectly removed; when this is accomplished you have an Amalgam ready to introduce *chemically pure*. Proceed to introduce it into the cavity, as directed elsewhere, being careful to allow no overhanging edges.

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THE

DENTAL TIMES,

A Quarterly Journal of Dental Science.

EDITED AND PUBLISHED BY

THE FACULTY

OF THE

Pennsylvania College of Dental Surgery.

E. WILDMAN, M. D., D. D. S.,
JAMES TYSON, M. D.,
Managing Editors.

PUBLICATION OFFICE: S. E. COR. TENTH & ARCH STS.,
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THE DENTAL TIMES,

A QUARTERLY JOURNAL OF DENTAL SCIENCE,

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The Fall Course will commence on the second Monday in September, and continue until the last of October.

During the Spring and Fall Sessions there will be one Lecture a day, from 5 to 6 o'clock, P. M., and, with the exception of Saturday, the Dispensary and Laboratory will be open daily for six hours.

The Fee for the Tickets will be $50.

The attendance of the entire Spring and Fall Courses will be deemed equivalent to the term of pupilage under a private preceptor during the recess of the regular sessions.

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CHEMISTRY.

The Course of Instruction from this Chair will commence with the considerations of the forces that act upon matter, and the laws which govern those forces. Chemical nomenclature, the individual elements, and the compounds resulting from their combination, will then be considered. The course will be illustrated by diagrams and such experiments as can be performed before the class.

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The instructions from this chair will embrace—the proper fitting up of a dental laboratory, the use of tools, refining, melting, alloying, and working of the precious metals, and the properties and combinations or alloys of the base metals used by the dentist; the description of the materials, their preparation, and the most approved formula for making porcelain teeth and blocks, together with the proper manner of compounding them; the history and properties of all substances called into requisition in making dental substitutes; the entire range of manipulation of the different materials used as a base, from the impression to the completion, and proper adjustment of the case in the mouth, and such other information as appertains to this chair. The lectures will be amply illustrated by specimens, models and diagrams, and the practical application will be given in the Laboratory, under the supervision of an accomplished Mechanical Dentist.

DENTAL PATHOLOGY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist. They will also include a careful examination of therapeutic agents and their general application. Their indication in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the application of all the Anæsthetic Agents.

DENTAL HISTOLOGY AND OPERATIVE DENTISTRY.

The lectures of this department will embrace the comparative anatomy of the teeth, the functions and microscopical pecularities of the dental organs, the development of teeth and their component tissues. It will also include a full description of the materials and instruments used in operative dentistry, and will comprise a thorough elucidation of all the operations required of the Dental Practitioner, such as filling, extracting, regulating, &c. &c. A portion of the course will be devoted to a description of the microscope and the modes of preparing specimens. The incumbent of this chair will practically demonstrate in the clinic the theories taught.

PHYSIOLOGY AND MICROSCOPIC ANATOMY.

The lectures from this chair will include human physiology, histology and physiological chemistry, with such portions of comparative physiology as are essential to a comprehensive understanding of the subject. The doctrines of life and organization will be appropriately considered. The course will be amply illustrated by appropriate diagrams, chemico-physiological experiments and vivisections, as well as by microscopical demonstrations.

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The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended

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Genuine Medicinal Cod-Liver Oil

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WESTON'S NEW METAL.

Contains no Antimony, Lead, Zinc, Copper or Mercury.

A FEW IMPORTANT FACTS CONCERNING IT.

This metal was first put in the market May 1st, 1871 ; its durability established beyond a doubt, as we have abundant proof of its having been worn for *eight years* previous to its introduction to the public.

The New metal is no offspring of, or relation to the once popular material known as "Weston's Metal." The purpose of this metal is to cast practical plates, suction or clasped, from a single tooth to the largest full upper or under plate. Exact copies of well-made gold or silver plates.

With these facts fully proved we make the following claims for Weston's New Metal, viz.: It is the best substitute for rubber yet offered ; it casts the strongest, thinnest and smoothest plates of any metal known. It is the cleanest style of work made. The metal itself is absolutely tasteless; delicate persons who cannot wear rubber or celluloid wear the metal with the greatest comfort. It is easier made and mended than any other style of denture. For accurate adaptation no other work compares with it.

EXTRACTS FROM LETTERS RECEIVED.

Philadelphia, Dec. 8th, 1871.

Dr. Weston.—My opinion is decidedly in favor of your New Metal as a substitute for non-expensive dentures.

Geo. T. Barker, D. D. S.
Pref. Pathology and Therapeutics Penna. College Dental Surgery.

Belleville, Canada, Sept. 25th, 1872.

Dr. Weston.—I wore a large plate of your New Metal for some time and found it superior to gold; there is no galvanic action, it is easily worked, fits better than gold and is stronger than rubber. We use it for clasps on our rubber plates with great satisfaction.

I am, yours truly,
G. V. N. Relyea, M D.

New York, Dec 6th. 1871.

Dr. Weston.—My wife has worn a full plate of your New Metal since 1863, now eight years, to her perfect satisfaction.

Yours truly,
C T. Bliss, M. D.

Canton, Pa., Sept 9th, 1872.

Dr. Weston.—I have used your New Metal since its first introduction, not only as a substitute for rubber, but in all cases where ordinary priced dentures are required. I find it gives entire satisfaction to my patients. Its strength and purity make it preferable to rubber in every respect.

Fraternally yours,
M. D. L. Dobson.

Oneida, N. Y., Sept. 9th, 1872.

Dr. Weston.—A year ago I commenced using metal for cast under plates. After trying all the alloys in the market for that purpose, I have decided that your New Metal is much the best of them all My patients like it much better than gald, silver or rubber. It does not tarnish in the same mouth that tarnishes fine gold. I consider it al that can be desired for a base for under artificial teeth.

Yours truly,
F. Norton,
Oneida Community.

Towanda. Pa , Sept. 5th, 1872.

Dr. Weston.—I am wearing a full upper plate of "Weston's New Metal," it is as tasteless and cleanly as fine gold I prefer it in my own mouth to any other material as a substitute for rubber. I would recommend it before celluloid or any other cheap base in all cases.

C. M. Stanly, Dentist.

Danbridge, Tenn., Nov. 4th, 1872.

Dr. Weston.—I have been using your New Metal since its first introduction. It makes as good a plate as any (gold not excepted.) I want those anti-vulcanite brethren to try it before denying it. I swedged the sample plate you sent me, and made as good a job as could be done with gold.

Yours truly,
G. A. Miller.

Towanda, Pa., Aug 31st, 1872.

Dr. Weston.—Weston's New Metal makes the most perfect casting of any metal in the market, casts exact copies of swedged plates, and as a substitute for rubber I believe it to be superior to any other cheap base, and would use and recommend it in all cases in preference to celluloid.

Truly yours,
W. B. Kelly, Dentist.

WESTON'S NEW FLASK.

Open top and bottom, stands on feet; is certainly the best in use, and indispensable in casting perfect plates.

For sale by S. S. White, Rubencame & Barker, Buffalo Dental Manufacturing Co., and at all Dental Depots.

Small sample plates and instructions sent on application to

H. WESTON,
Towanda, Pa.

PRICE OF METAL.

In 1 lb. packages	$8 00	Flask	$1 00
In ½ lb. "	4 00	Solder, per oz	1 00
In ¼ lb. "	2 00		

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Extract of Beef, Citrate of Iron and Sherry Wine.

As a Nutrient Tonic and Mild Stimulant, this combination has proved especially efficacious in many cases of enfeebled digestion, loss of tone and vigor, impoverished blood, and in the many ailments consequent upon general debility. It is prepared with great care from selected beef, one-third of which has been partially roasted to develop the osmazome ; thus rendering it more grateful to the taste and less apt to occasion disgust from continued use.

We claim and believe that our Extract of Beef is superior to any offered to the Medical Profession or to the Public, and it is used in this preparation.

Each fluid ounce represents two ounces of fresh beef and four grains of Citrate of Iron in one ounce of Pure Sherry Wine.

ADULT DOSE.—One tablespoonful three or four times a day, between meals, or when fatigued and exhausted. The dose for children should be graduated according to the age.

SYRUP LACTO-PHOSPHATE OF LIME.

PHOSPHATE OF LIME has been universally recognized as a remedy of great value in the various forms of Scrofula, in Phthisis, and in the diseases dependent upon Defective Nutrition.

The disappointment which frequently follows its employment, due most probably to an inability on the part of the system to appropriate the materials supplied by Phosphate of Lime, has led to a search for means to secure its absorption ; and this has been best accomplished by its combination with Lactic Acid, in the form of a Lacto-Phosphate of Lime.

M. DUSART, the eminent and conservative French Physiologist, who, after long continued and exhaustive experiments, has tested it thoroughly, is satisfied that it supplies the want recognized in the simple Phosphate, and believes that its definite action and powerful effect will soon cause it to rank with Bromide of Potassium and Hydrate of Chloral, as one of the most valuable of the new preparations which have lately been brought before the Medical Profession.

Its use in the French Hospitals, demonstrates that it exceeds all agents tried in stimulating the functions of nutrition. All who have used it, unite in advocating its special adaptation and value, when given to children and infants, where these functions are so often deficient.

We prepare this salt from the formula most approved by the French Chemists, and manufacture from it a syrup pleasantly flavored, which contains two grains of the Lacto-Phosphate of Lime in each fluid drachm.

DOSE. Adults should take a dessertspoonful two or three times a day ; children, a teaspoonful, and for infants, the dose should be graduated according to age.

We ask the attention of Physicians to the above more recent remedies. We will send on application, Price Lists and Circulars of all our Pharmaceutical Preparations.

JOHN WYETH & BRO.,
Philadelphia

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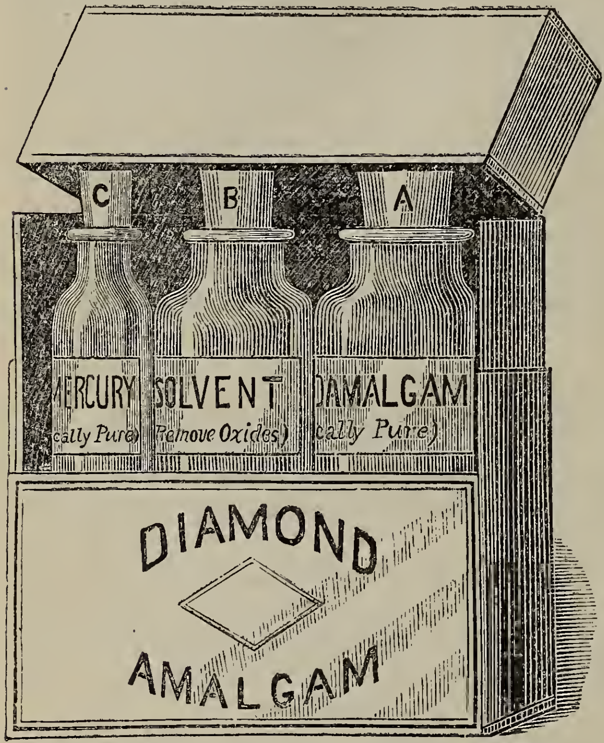
DIAMOND AMALGAM

Composed of pure Gold, Silver, Platinum, Tin and Mercury.

This Amalgam is prepared under the inspection of an eminent Analytical *Chemist* of Philadelphia, which enables us to guarantee perfect and absolute *chemical purity* in the metals employed.

The advantages of this Amalgam are complete and perfect adaptation of the material to the walls of the cavity, with less shrinkage of the plug than with any Amalgam ever offered for sale, which we have demonstrated by actual experiment. This Amalgam when properly burnished and polished (and all Amalgam fillings should be thus treated) will retain, except under *very* unfavorable circumstances, a beautiful bright polish unaffected by use or oral secretions.

This Amalgam is no new compound, but has been subjected to the severest tests before offering it to the dental public.



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FROM AMALGAM,

Is due to several causes, hence the following DIRECTIONS SHOULD BE OBSERVED IN ALL CASES:

1st.

Carefully prepare every cavity as if for a gold filling.

2d.

Carefully prepare the Amalgam, and pack in small pieces, so that there is perfect contact with every portion of the walls of the cavity.

3d.

Keep the cavity and filling *dry* during the whole operation of filling.

4th.

Use only Amalgams compounded of pure metals. If the above cautions are observed, Amalgam fillings will be found to answer a necessity, as there are circumstances where only plastic fillings can be used advantageously.

This Amalgam is put up in the following careful manner:

A. A bottle containing the Diamond Amalgam.
B. A bottle containing the Solvent.
C. A bottle containing pure Distilled Mercury.

All enclosed in a neat paper box, in which is also placed a piece of chamois, the whole forming a compact and exceedingly desirable package.

DIRECTIONS.

Prepare the cavity carefully as for a gold plug, making either an undercut, groove, or retaining points, take as much Amalgam as is considered necessary into the palm of the hand, from the mercury bottle pour out a small quantity of that metal, and after uniting the two by rubbing them together, press out the superabundant mercury through the chamois skin by means of pliers, *throwing away* the mercury, which is unfit for use again. Then add to the mass a small quantity of the *Solvent*, and rub them carefully together, then with warm water wash the mass until the water runs off perfectly free from discoloration. The Solvent removes perfectly the oxides of the metals, which have been formed by contact with the atmosphere. Rub the mass until these are perfectly removed; when this is accomplished you have an Amalgam ready to introduce *chemically pure*. Proceed to introduce it into the cavity, as directed elsewhere, being careful to allow no overhanging edges.

Price per ounce	$4 00
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